GLEANINGS IN BEE CULTURE

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EDITORIAL

By E. R. ROOT.

IT is a good time now to bottle honey for the local trade. There is a large amount of literature bearing on this question; and if the reader has any extracted honey that drags on his hands, let him try bottling, supplying his local groceries with the product.

OWING to a considerable amount of advertising matter coming in at the last moment we were compelled to leave out two pages of editorial matter from our last issue. Our readers will have noticed that, with the exception of editorials, all the department writers are confined to one page. This was necessary in order to increase our questions and answers in the Heads of Grain department.

HOW TO LIQUEFY CANDIED HONEY WITHOUT IMPAIRING ITS FLAVOR OR COLOR.

MR. E. E. COVEYOU, of Petosky, Mich., the man who does such an extensive business in bottling honey, says that it is very important, in liquefying honey, to draw off the melted portion as fast as it melts. If the liquefied product is kept under heat until all the solid portion of the honey has become dissolved, it will lose some of its delicate flavor and darken somewhat in color. The same suggestion has come from other sources; and we may say in addition that Mr. Coveyou's experience has been quite in line with our own. It is a fine art to liquefy honey, and do it right, without impairing the flavor or color.

Right in this connection we discovered in our experiments with the capping-melter that it was important to allow the free honey to run off as fast as the cappings melt. The conditions in a capping-melter are much the same as those that are present in a tank that is melting up candied honey.

SPACING THE COMBS WIDER APART FOR WINTER.

THE suggestion has been made by a recent correspondent that, for outdoor wintering at least, the combs should be spaced wider apart than the summer spacing in order to give the bees more clustering room. Having tried it with good results he wished to know why the plan was not more generally practiced. Years ago we, in common with others, did this to a considerable extent. We also tested some colonies with regular spacing and others with wider spacing side by side, but could see no difference. During the last twenty years, during which we have used Hoffman frames spaced 1⅜ from center to center, we have left the combs in winter spaced just as they were in summer; and any one who has followed our wintering knows that we have been generally quite successful.

THE BEE-KEEPER'S REVIEW PROSPERING.

THE *Bee-keeper's Review* is now in a new and larger home of its own. Mr. Hutchinson and his son-in-law bought out a printing-plant formerly owned by the Michigan Paint Co. This has been renovated and requipped with about $1000 worth of new machinery, and the editor is now looking forward to the day when he can carry out some of his ideas toward making a better *Review*. It has always been a good paper, both typographically and for the real helpful subject-matter which it contained. Mr. Hutchinson has a very pleasing way of injecting his own personality in all of his writings; and there is no reason why his journal will not grow better and better. GLEANINGS extends its congratulations and best wishes.

ALFALFA.

A NEW bulletin from the United States Department of Agriculture, Farmers' Bulletin No. 339, entitled "Alfalfa," has just been issued. This is a very comprehensive treatise, taking up the general subject of alfalfa and its cultivation, both in the Eastern and Western States. Any one who has any thing to do with the growing of this important forage-plant will do well to secure a copy of this bulletin. It is free.

On page 30 we note that "it is the practice in the West to cut alfalfa hay for sheep just as it commences to bloom, instead of when one-tenth in bloom, as is customary for dairy cattle, or when one-half to two-thirds in bloom for horses." On the subject of alfalfa for bees we find this:

> The development of the honey-producing industry in the West has been practically coincident with the extension of alfalfa culture. Statistics indicate that the heaviest yields of honey per stand of bees are secured in the sections showing the greatest acreage of alfalfa. That the honey is of good quality is evidenced by its standing in exhibitions of this class of products. The number of times that the alfalfa-fields come into blossom during the season makes possible the gathering of successive crops of honey.

THE FALL DROUTH, AND DID IT KILL THE CLOVERS?

IN response to our request on page 1426 of our Dec. 1st issue for information as to whether the severe drouth last fall had killed clovers so that there would be a light crop of clover honey next season, we have received a large number of reports. In the main they go to confirm the statement made by our farmer friend on p. 1365, and again on 1426, that the clovers are in good condition, and that a fall drouth has not killed them

provided winter snows and spring rains follow in proper succession.

There are some among the number who say that, where the drouth began in August and continued up till cold weather, the probabilities are that the old clovers have been killed.

One writer goes so far as to say that the drouth has been so severe in his locality that he predicts there will be no yield of clover next season, and he has, therefore, moved his bees to pastures new.

All agree that the young clovers, if the old ones are killed, would, with a proper spring and summer, spring up, but that they would not yield much honey. Their time for furnishing nectar would not be due until the season following.

On the subject of winter-killing, as to what it means, it is explained that a rainy winter, followed by alternate freezing and thawing, during which the soil assumes the appearance of a honey-comb, will destroy the clovers, because the action of the expanding and contracting of the soil results in separating the top from the roots, and the fine roots from the main ones. The general effect of this is to injure or kill the plant outright.

Thus far the winter throughout has been dry in most of the Northern States. Needed rains and snows have fallen pretty generally; and there has been, therefore, but little of the destructive honey-combing of the soil by which the clovers are dismembered. If deep snows should now come on, there would probably be no serious damage to the clovers.

As nearly as we can glean from the various reports published in this issue, it is apparent in some localities that some of the clovers have been killed, so that there will not be much honey from clover next year. In most places the plants have not been destroyed. It is our opinion, based on the majority of reports, that there will be a fair crop of clover honey next year in the country generally, although in some sections, of course, there will be practically none.

DEATH OF MR. C. H. W. WEBER.

IT is with much regret that we record the death of Mr. Charles H. W. Weber, of Cincinnati, on New Year's day. Those who attended the Detroit convention will remember seeing him at that meeting; but, unfortunately, he was not well, as he said that he was afraid he would have to get under the care of the doctor as soon as he could get home. Shortly after that, we learned that he had undergone a serious surgical operation, but he apparently recovered from that. When in Cincinnati some weeks ago we called to see him at the hospital, and found him doing quite well, and anxious to get home. As we had had some hospital experience of our own we cautioned him to make haste slowly. We left him with the belief that his recovery would be complete. Some weeks afterward we received news from his family, to the effect that his condition had taken a sudden turn for the worse, and it was feared that he would not be able to recover; he apparently rallied somewhat from this, but it was for only a short time, and just as the new year dawned he passed away.

Mr. Weber was born in Lemfoerde, Germany, April 1, 1844. In May, 1899, he bought out C. F. Muth & Son. Although well advanced in years at the time, he took up the general subject of bee-keeping with an enthusiasm seldom shown by one of his years. He began the selling of supplies, and of bees and queens. He had quite an apiary on the roof of his building. His business continued to grow, and in the mean time he had good help in the persons of his son and daughters. Mr. C. W. Weber, a son, has had practical charge of the business for the last six or seven years. He is an energetic young business man, having sold honey extensively all over the country; and it goes without saying, that the business in the future will go on as before.

In the line of bottling honey the Webers have a very complete plant. When I called there last, Charley showed me a special invention of his own for bottling honey in a wholesale way. So extensive is his bottling business that he used a rotary pump for pumping honey from one tank to another. Indeed, he is in position to do and does do a large business.

We are sure that the sympathy of all our readers will go out to the surviving members of the Weber family, especially to his son Charles, upon whom the responsibility and management of the business has fallen. The junior Weber is no novice in the business, having grown up in it as the practical manager of both the supply and honey departments.

INCREASING THE WORKING ENERGY OF BEES BY SHAKING; IS THE PLAN A JOKE?

IN the *Bee-keeper's Review* for December appears an article by Mr. G. W. Williams on the subject as above. In this the writer says he believes that new life can be shaken into bees whenever they show a tendency to loaf. From some experiments that he has conducted in a small way he is inclined to think there are big things for the future in scientific jarring.

He bought six colonies of bees of a neighbor which he desired to hive about fifty feet away on his own premises. To prevent their going back he shook all the bees in front of their respective entrances after the hives had been moved. Nearly every bee stayed. When it came time to put on supers he shook the bees in front of their entrances again. It became apparent that those that had been shaken were in advance of his other colonies not so treated. One colony in particular that had not received the "quakes" was sulking; but after it had been "dumped" he said it started immediately to work. At other times when he found a colony hanging out he would rap on the hives to induce the bees to fill themselves. Then he would shake the bees off the frames and out of the supers, when, presto! new energy seemed to be imparted.

He goes on to tell how he shook his bees in the spring; how he shook them to stimulate them; shook them to make them go into the sections; shook them when they loafed; shook them when he introduced queens; in short, he shook them on *general principles*.

At first Editor Hutchinson was inclined to believe that this jolting business was a fancy or a joke; but on further reflection he believes there may be something in it.

Those who attended the Detroit convention will remember that the editor of GLEANINGS gave

a talk on this subject, explaining how the most vicious bees could, by proper shaking, be made as tame as kittens. We also stated at that time that, in our opinion, the shaking might be used in a practical way in the production of honey; for introducing queens; in fact, for a great variety of purposes.

In the various lectures that we have given before the bee-keeping public, during which we have given live-bee demonstrations, we have learned that it is possible to do a large number of hair-raising stunts after the bees have been subdued by the shaking process. They are shaken off the combs into a large dishpan, when the pan is shaken a good deal like a corn-popper. The bees roll over in a confused mass; and after about a minute of rolling and tumbling they can be picked up with bare hands with perfect impunity providing they are not pinched. We are, therefore, inclined to believe that there is more in this shaking, for the accomplishment of practical results, than many persons are inclined to believe.

The "shook-swarm" method that was discussed so much two or three years ago gave excellent results, both in the matter of controlling swarms and in the production of honey. The method advocated by Mr. Williams is precisely the same, only he goes much further. He does nothing more nor less than to put the bees in the condition of a swarm As every one knows, a swarm is always more energetic than an ordinarily normal colony.

We shall be glad to get reports from those who have had an opportunity to try this scheme of earthquakes on a small scale. No doubt it is quite possible to go to extremes.

Later.—Since writing the foregoing we have read what one of our Department Editors, Mr. Louis Scholl, has to say on this subject. See page 53.

DOOLITTLE'S BOOK ON NON-SWARMING.

This work is going off like hot cakes. So great has been the demand for it that the first edition was exhausted inside of thirty days. We have now gotten out an entirely new reprint and a much larger edition.

There are many of our readers whose subscriptions are about to expire; and in order not to lose a single number we are making an exceptionally low combination offer—namely, GLEANINGS one year and Doolittle's book, 50 cents, for the price of the paper alone—$1.00. Even if you read the series of articles in GLEANINGS you will surely want the whole set in one cover to facilitate ready-reference.

Besides the one important subject of the prevention of swarms when running for comb honey at out-apiaries, Mr. Doolittle has discussed in his characteristic and forcible manner many others almost as important, particularly those relating to the production of fancy comb honey, and how to secure a crop when every one else meets a failure. Indeed, the author has condensed his forty years of experience into this one volume, and no reader of these pages should fail to get it. The book can not now be had except in connection with subscription to GLEANINGS (our former sale price of 50 cents being withdrawn). If you have already renewed for 1909, send your renewal for 1910 at $1.00, or order the journal for a friend, and we will send you a copy of Doolittle's book for your trouble. As an evidence of what can be done with the Doolittle system we introduce a letter here from Mr. C. H. Root, which speaks for itself.

DOOLITTLE'S PLAN FOR PREVENTING SWARMING ENDORSED.

I have tried Mr. Doolittle's plan for swarm prevention, as first described in GLEANINGS, for two years. The first year, with five colonies, I had a loss of two swarms (my fault). This year, with about forty colonies, I did not lose a swarm, and I had a larger yield of honey than I ever had before.

Red Bank, N. J., Nov. 19. C. H. ROOT.

This is a sample of many that we have been receiving; and what others have done you can do. Remember, you can not get this book except in connection with a subscription to GLEANINGS.

ALEXANDER'S WRITINGS IN BOOK FORM.

Perhaps no series of articles ever evoked more general interest and discussion than those written by the late E. W. Alexander, of Delanson, N. Y. He was one of the contemporaries of Quinby, Langstroth, Hetherington, Grimm, and Hoffman, besides many other great lights in the early days of apiculture. He survived them all, and it is only within the last three months that death claimed him also; but, like many another, his works live after him.

Mr. Alexander had a very remarkable bee-keeping experience. For many years he was one of the most extensive producers of honey in the United States. But the thing that, perhaps, more than any thing else brought him celebrity, aside from his very interesting and helpful writings, was the fact that he managed for a number of years an apiary of from *500 to 700 colonies all in one location.* He had a locality that was quite remarkable, and brains that knew how to use it.

Well, in this series of articles Mr. Alexander describes many of the secrets of his great success. Scarcely a bee-keeper at the time of his death had had more experience in keeping bees; and yet almost up to the last moment his enthusiasm for his chosen pursuit was as keen as that of a beginner passing through the various stages of bee-fever. He was a genius, and as such he propounded some theories and advanced some practices which to some seemed unorthodox, and his articles, as a consequence, drew forth not a little comment and criticism. But he always came back with that same gentle rejoinder that characterized the sweetness of the man's entire life. Nor was he unable to give a reason for the faith that was in him.

This work, now in the press, will be clubbed with GLEANINGS for the price of the paper alone —$1.00. The regular price of the book is 50 cents; but it will not be sent separately except in connection with a subscription to GLEANINGS, and all arrearages, if any, paid. If a reader has already renewed his subscription for 1909 we will accept his subscription for 1910 at $1.00, and send on the book as soon as it leaves the printer's hands. We hope to have it ready for distribution in about two weeks.

There may be some who desire both Alexander's and Doolittle's books. Send us $2.00 and we will send GLEANINGS two years and both books, or for one new subscription at $1.00 and your own renewal at $1.00 we will send you the two books.

STRAY STRAWS

DR. C. C. MILLER

J. W. GEORGE, here's my hat off to you and your Imperial crowd, p. 37.

"WHITE CLOVER being an annual," page 40. Isn't that a mistake? In this locality it's a perennial. [Yes, everywhere Thanks for calling our attention to the uncorrected error.—ED.]

T. B. TERRY, in *Practical Farmer*, wonders why I don't continue eating wheat. Friend Terry, in college I was my own cook. I'm married now. But my wife swears by Terry; and if you say I ought to be eating wheat, no doubt I'll be at it again.

NOT SO LONG ago I wrote a honey leaflet in which I gave 60 lbs. of sugar as the average consumption in the United States. The increase since then has been enormous; latest United States reports say 82.6 lbs. for each man, woman, and child, of continental United States.

THE EMPEROR OF GERMANY has sworn off drinking. President-elect Taft has done the same thing. Ohio has a new county going dry every few days. Oh! we are living in glorious times. [If more of our big men will take this stand it will help still more to further the cause of temperance.—ED.]

FRIEND HAND, I'm with you for improvement in breeding, p. 26, and I believe supersedure is bad with bad stock; but I believe it's good with good stock. I know that, in nature, there's survival of the fittest; but did it never occur to you that every fittest queen that survives ends her career by supersedure?

GEORGE W. WILLIAMS asks me what I think of shaking up bees as a stimulus to honey-getting. Friend Williams, it looks to me like rank nonsense; but when two such men as you and Scholl get after me it shakes *me*. Your testimony is strong; but it will be stronger if, next year, you shake and then report difference. [See editorial in this issue, page 48, on this subject.—ED.]

R. C. AIKIN, in addition to what you say, p. 25, I've seen bees plaster white wax on a feeder. I wonder if it may not really be that all secretion of wax is an involuntary result of gorging with honey, which gorging may be voluntary or involuntary. If so, we might say that secretion is generally voluntary, but sometimes involuntary. [Mr. A. has something to offer in this issue on the subject. See page 61.—ED.]

GOVERNMENT REPORTS say that in 1907, for the first time, the production of beet sugar exceeded that of cane—967,000,000 lbs. of beet against 544,000,000 of cane. [I think what you say applies to the world's production of sugar—about 5,000,000 tons of beet and the same of cane. The United States alone consumes about 3,000,000 tons as follows: Cuba (1909), 1,500,000; Porto Rico, 250,000; Hawaii, 400,000; Louisiana, 250,000; beet, 400,000, and the West Indies and Java for the rest. The *per capita* consumption for the United States is 82 lbs., and Great Britain 95 lbs. (mostly beet sugar).—W. K. M.]

HARRY GRIFFIN wants me to tell why I think "it is honest as well as profitable to use full sheets of foundation in sections." What can there be dishonest about it? Foundation is pure wax, and I don't notice any difference in eating it. If it were dishonest to fill the section, would it be honest to use a starter? It is profitable because bees do faster work, fill the section more evenly and securely, making all worker comb, which makes a better-looking section, and does not tempt the queen to go up as drone comb does. [Quite right you are.—ED.]

A. I. ROOT, if you can get people to use that Coward shoe, p. 1514, or even if you can do any thing to get them to wear shoes half way comfortable for their feet, you will accomplish a feat. It isn't altogether that the present shoe differs in shape from the foot. The greater trouble is the insisting that a No. 6 foot shall go into a No. 5 shoe. Personally, although I'd rather have a shoe the shape of my foot, I get on fairly well with the ordinary shoe. Never a corn to my name—or to my foot. But I've always insisted that, whatever the shape of the shoe, there must be room in it for my foot. After you get everybody to wearing Coward shoes, there's another thing for you to tackle. That's the stoutness of the shoe. Take a man and a woman of equal strength, with feet of the same size, and the woman will insist that she can not wear a shoe as heavy as the man's. Now please tell me why.

JOHN SILVER, *Irish Bee Journal*, page 74, says: "Concerning the remarks of Editor Root and Dr. C. C Miller, in GLEANINGS, on my statement in Augu.t issue of *Irish Bee Journal* on queen-rearing, permit me to suggest to Dr. Miller that it is not the heat of the hive nor the strength of the colony which accounts for the difference in the time of a queen's hatching. For example, I have had three cells sealed during the same morning. One would hatch in six or seven days after beeing sealed, another eight days, while the third might take nine or ten days. I have further observed that some of the best-developed queens are those which take nine days to hatch after being sealed; consequently I can not agree with Dr. Miller that it is the heat of the hive, because different times occur in the same hive, or that a queen is any the worse for taking 17 or 18 days to hatch." Thanks, friend Silver, for additional facts. Every fact helps. If I understand you aright, in the same hive there was a difference of about three days in the time occupied by two royal larvæ from sealing to emergence. But we are to conclude from this that there was a difference of three days in the length of time from the laying of the egg to the emergence of the queen? Might it not be that there was a difference of three days in the ages of the two larvæ at the time of sealing? I do know this: That I have been very much surprised in a few cases, upon opening a sealed cell, to find the larva quite small. It looks a little as if the bees said to themselves, "Here's a larva in this cell that's pretty young yet; but there's more food in the cell than it can possibly use, and we may as well seal it up and done with it." At any rate, if my observation is worth any thing you may take it as a fact that at times a very much smaller larva is sealed than at other times.

CONVERSATIONS WITH DOOLITTLE

VARIOUS POSITIONS OF THE ENTRANCES IN WINTER; UPWARD VENTILATION.

"Mr. Doolittle, you can remember how they used to winter bees before the movable-frame hive came into use, can you not?"

"Yes. Our bees were first kept in the Weeks patent hive, which had a bottom-board attached to the hive with wire hooks, which were so arranged that, by turning a button, the bottom-board would hang down from the hive an inch below the bottom all around during winter or during hot spells in the summer months. By pushing this bottom-board forward, and turning the button another way, it would come up tight against the hive, and project in front two inches for an alighting-board. The entrance was cut from the bottom of the hive, so that, by turning the button, all could be closed secure except the entrance, which was enlarged and contracted at will by the sliding door, which was simply a strip of tin free to move in a groove. The front of this bottom-board was some three inches lower than the back, so that any dirt, cappings of brood, moldy pollen, larvæ of the wax-moth, which the bees might release from the combs above, and particularly all dead bees which died during winter, would roll down and out of the hive, thus keeping the hive free from moths and dead bees during the whole season. I can almost see that Weeks salesman now as he rolled off in the smoothest terms the *great* value the Weeks hive had above all others, especially for winter."

"What were his claims for the lowered bottom during winter?"

"Lower ventilation, claiming that such was the best thing then in sight for safe wintering of bees. Things went on all right for several years, as our home then was what would now be called a clearing in the woods; but a few years later, after the woods had been cut off more, father had poor success in wintering bees, while a neighbor wintered his successfully with the hive tight at the bottom and a two-inch auger-hole at the top. Seeing how successfully bees wintered for our neighbor, father bored holes in the top of part of our hives, and left the button turned, thus closing the entrances to such hives, while the rest were left as before Those having the hole at the top with the closed bottoms wintered so much better, and proved themselves so much better in every way, that the bottom-boards were left fastened to the hives during winter with all of the colonies, the bees being allowed to go in and out from the holes at the top. After this we had very little trouble in wintering."

"Do you use holes at the top of the hives now?"

"No. After a few years father lost all of his bees by that dread disease, foul brood, and no more were kept in the family till I purchased again in 1869. At that time there were plenty of bees kept near me in box hives, many of which were set on blocks, raising the hive from the bottom-board from one-half to one inch, as recommended for wintering on the lower-ventilation plan."

"Did you raise your hives in this way?"

"No. I adopted the upward-ventilation theory (it was considered by nearly all only theory then), but not a direct current of air through the hive. After a series of severe winters, myself and three or four others had about 300 colonies of bees which wintered with upward ventilation every year, while not one of the box-hive or lower-ventilation men had a single colony."

"Were you still using the holes at the top of the hives?"

"No. About this time I began hunting bees in trees by going through the woods on the first warm days in early spring while the snow was on the ground in the woods, when, by the dead bees dropped on the snow during their first house-cleaning time, the tree containing the colony could be easily found. These trees were cut later, the bees and combs transferred into movable comb hives, this giving me an additional start in bees. By looking at these natural homes of the bees in these hollow trees I could find that the hollow in most cases was composed of partially decayed wood, especially from one to three feet above the combs. This seemed better to me than holes at the top of the hive, for in winter the moisture from the bees passed into this decayed wood which surrounded them, while, later on, it would be expelled each summer by the heat. In this we had something pointing toward the advisability of a porous covering for our bees for winter, from which idea originated cotton-padded comfortables, supers filled with forest leaves, sawdust, and ground-cork cushions, chaff hives, etc., all of which have had their advocates."

"What about the entrances where such were used?"

"Some closed the entrances entirely, believing that the bees could get all the needed air through the porous covering above, while others left the entrances wide open. I made a rim of ⅞ inch stuff, 1½ inches deep, putting this under each hive so that the dead bees and dirt could drop down into it and away from the combs and bees above. Then leaving an entrance in the top of this rim ½ inch deep by 2½ inches long, I leaned a wide board up in front of the hive and this entrance. This allowed the bottom of this board to stand out and away from the hive and entrance some four to six inches, when, in this way, I had nearly the same thing we had with the Weeks hive, without any of the disadvantages that hive contained during the winter."

"I see. That board kept the wind from blowing into the entrance, while at the same time the bees were allowed to fly during suitable weather by coming out around the ends of the board."

"Yes; and the chaff and sawdust cushions, directly over the combs, absorbed all the moisture so that the bees were kept dry and nice."

"Do you recommend wintering in that way?"

"Yes, where bees are wintered out of doors. But for our long, extremely cold winters here in Central New York, I would recommend cellar wintering in preference to any plan in which the colonies are left out. Central New York is now a very different place from what it was fifty to seventy-five years ago, when four-fifths of the land was covered with forest. Now nine-tenths of the land is nude and bare, except during the summer months, when the regular crops are growing on it."

SIFTINGS.

By J. E. CRANE

TELLING AGE OF QUEENS.

On page 1304, Nov. 1, Dr. Miller tries to tell the difference in the looks of an old and young queen, and has succeeded pretty well. You wouldn't have thought it, but I believe he has missed just the best word for this purpose; and that is the word "dull," for describing color. Whether the queen is black or yellow or chestnut when young, the colors are bright; but when old they have a dull faded look.

WHEN A COLONY HAS STORES FOR WINTER.

Page 1363, Nov. 15, Dr. Miller quotes Quinby as saying that "a colony which has stored in supers may be expected to have plenty of stores for winter." He then gives, as a reason why it is not true to-day, that it is because he said it before the days of extracted honey. Well, it is true a super in those days meant a box for storing comb honey in, and not for extracting; but it is also true that it was in the days of box hives with a few small holes from the hive into the super; also when the hive he used was 12 inches deep; and perhaps the best reason of all was because he lived in a buckwheat section where bees could usually gather honey till frost. See?

CAPPING-MELTERS.

On page 1375 we find an article by H. H. Root on capping-melters, nicely illustrated. The article is written in such a frank, candid way, and the conclusions are so straightforward and sensible, that it must commend itself to all. My son said to me the past summer that we must have a capping-melter another year. I replied, "Yes, perhaps;" but I meant no, for those I had seen illustrated seemed quite too complicated or expensive to be worth while; but this article places the whole subject in a new light, and we feel as though we must fall into line or be left behind.

By the way, the side lights thrown upon Mr. Fowls, his family, and business, are fine, and I feel as if I had made them a visit—at least I feel better acquainted with them.

WAX FROM OLD COMBS.

I do not think, Mr. Editor, you emphasize the value of old combs for melting quite enough, p. 1366, Nov. 15. I believe of late years we average not far from 3 lbs. of wax from each 8 old combs melted, and we find our medium foundation to run about 7 sheets to the pound, thus giving some 20 sheets of foundation for the eight old combs; and the 12 extra sheets of foundation more than pay for the work. But we do not, as a rule, find new sheets of foundation as valuable as drawn combs, and especially those of some age, for some purposes. Bees will spread their brood or store honey during the cool spring weather much faster in old than in new white combs—at least they much prefer the old dark combs until hot weather comes. [See editorial, p. 1425, Dec. 1, and Dr. Miller's comment, p. 1488, Dec. 15.—ED.]

SHOULD THE PRODUCER BE PAID FOR THE CANS IN WHICH THE HONEY IS SOLD?

Page 1245, Oct. 15, Dr. Lyon thinks a gross injustice is being done the bee-keeper for not allowing him at least half the cost of his tin cans containing extracted honey. Dr. Miller, page 1303, Nov. 1, thinks if the producer gets half a cent more for honey in cans than barrels he is amply repaid. I think Dr. Miller is right. I believe any one who has dug granulated honey from large barrels in winter would rather pay the half-cent extra for the tin cans.

But there is another side to this question. If the buyer had to pay the producer half the cost of his cans, why should he not pay half the cost of the barrels and half the cost of the cases comb honey is shipped to market in? Let's see. The producer of *extracted* honey buys a case of two cans for 50 cents; fills them with honey, and sells the whole for $10.00, his containers costing him five per cent of what he gets. The *comb-honey* producer, for 18 cts., buys his shipping-cases that hold 20 lbs. of honey, and gets, say, $3.00 for each case, so his containers cost him six per cent of the whole. This is a larger percentage than that of the man who sells extracted honey in new tin cans.

But Dr. Lyon may say the cases in which comb honey is sent to market are of no value except for kindling after being used, while the honey-bottler turns around and sells his cans for what he can get. This seems to gall Mr. Lyon more than any thing else; but, after all, it seems to me this is not half so bad as in some other branches of trade. Take the apple-producer who has to pay 35 cts. for his barrels, and gets $1.75 for his barrel after being filled with his choicest fruit. The barrel goes with the fruit; and yet when empty it is worth nearly as much as when new. The apple-producer pays 20 per cent of what he gets, while the producer of extracted honey pays but 5 per cent.

It is almost universal custom in this country to sell packages with the goods they contain. The only exceptions I think of now are egg-crates and crates for shipping small fruits, both of which are returned to the producer.

We have sold a good many five-gallon cans the past year. As we sold cheap, it saved those who bought about as much as we saved by selling. In some cases we have bought back the same cans filled with new honey, none the worse for the exchange.

CASES FOR CANS.

Cases in which tin cans are shipped are not always as substantial as they should be. We get them split and broken badly, and in some cases they are entirely gone. There is also less caré taken in nailing them up than there should be, for some cans (I will not say many, although I feel like it) have nail-holes in them. In some other cases the caps are not screwed down tight, and the loss from this source would surprise those who ship honey could they see it.

It does not seem to stimulate the Christian virtues, in emptying a five-gallon can, to find that, owing to a little nail-hole in a lower corner that has been overlooked, the honey has mostly run out of the can, and its place taken by water from the melting-tank. My brethren, these things ought not so to be.

BEE-KEEPING IN THE SOUTHWEST

By Louis Scholl

It is a good time now to have all your necessary hives, supers, and other supplies on hand to put up these wintry days when very little else can be done. That's the way to have "the tub ready when honey comes pouring down." It pays. Order early, save the discount, avoid the hurry and worry, and be ready for the honey and —money.

●

PROSPECTS FOR NEXT SEASON IN TEXAS.

There will be lots of swarming next spring in these parts of Texas if the season is favorable. The hives are chock full of good fall honey. Late breeding made the colonies strong, and preparations for controlling swarming should be made as early in the spring as possible. Give plenty of room, prevent a crowded brood-nest, give ventilation at the entrance, and keep the bees too busy and contented to swarm.

●

UP OR DOWN STROKE IN UNCAPPING.

That's a fine picture on page 1378, showing a man uncapping a comb over the new capping-melter; but what interests me is the fact that he uses the upward stroke in uncapping, drawing his knife from the bottom or lower end of the comb upward to the upper end. I have tried both the up and the down stroke in uncapping tons and tons of honey, using many different knives, and I often wonder why the upward stroke is used. I have tried it often, especially to find the better way, and I have come to the conclusion that downward shaving is what I prefer. It seems easier to me; the knife can be handled better; the comb need not be tilted so far, and the cappings fall over and off readily instead of hanging to the knife.

That butcher-knife that we have used for several years for uncapping has been improved from year to year; that is to say, a better one (in our estimation) has been adopted. Our first knife was a straight pointed one. The next had a somewhat larger and rounding point to get into the "low places" more easily. That was an advantage. But it was often difficult to shave off the cappings with the straight cutting edge when the top-bars were wide, and the cappings did not extend beyond the edges of these top-bars. This difficulty was overcome by using a knife this season with a slightly curved blade, so that the cutting edge, being more or less rounding, would reach down into the comb, and thus get the cappings off with ease.

●

"SHAKING" ENERGY INTO BEES.

That bees can be stirred up to greater activity by certain manipulations seems to be an entirely new subject to some of our bee-keepers. Editor Hutchinson, in the December *Review*, in referring to an article on that subject by Geo. W. Williams, on page 367, of the same issue, says it reads like a fairy tale; but he adds that he has stopped laughing at new inventions or ideas that appear too ridiculous to be true, and he urges that the plan be given a trial. There is much of truth in this idea, and we have made use of it for several years. The discovery (?) was already made by me in my first bee-keeping years, more than a dozen years ago, and ever since that time it has been practiced in our apiaries. Many times I have claimed that this was the secret of being able to "squeeze" just a little more honey out of the same localities where other bee-keepers were doing only fairly well.

Several times I have called attention to this matter under the subject of moving bees just before a honey-flow. Besides my article on this subject on page 1494, last year, reference to the same matter is made on page 388, March, 1907. Besides these, mention has been made of the value of manipulating the bees to stir them up into "energy" several times when writing about the use of the divisible-brood-chamber hive, etc. This plan is a valuable one that has been overlooked. Try it the coming season.

●

SHALLOW OR DEEP ENTRANCE CLEATS ON BOTTOM-BOARDS.

In making several hundred hive-bottom boards, cleats for only ⅜-inch-entrance room are provided this year. We have tried different depths of entrances, and find ⅜ best for winter; but this must be enlarged to at least ¾ inch during the working season. We had trouble with ¾-inch spaces running clear back under the frames, because the bees are inclined to build "ladders" up to the bottom-bars of the frames, and it is often impossible to loosen them from these. With the space diminishing to ⅜ inch at the rear, this is obviated. For several years, narrow strips from shingles were used on the side cleats during the working season. These were removed in the late fall. We do not like permanent cleats ¾ inch thick in front and ⅜ in the rear, as the enarances can not be lowered when desired. Neither do we favor reversible bottom-boards — too much fuss. Instead of all these we now place under the middle of the front end of the hive a small stone or any thing else we can find that is about ¾ inch thick. This gives not only a large entrance, but more ventilation, as the opening extends part way along the sides of the hive. The bees do not bother one's feet or legs, as they are driven away from the sides by the few puffs of smoke always given at the entrance. By inserting the hive-tool in the entrance it is an easy matter to pick up something and place it under the hive in only a few moments. The objects are removed in the same way. They cost nothing, save time and labor, and serve better for the purpose than any other contrivance that has come to our notice.

We make all our bottom-boards now out of rough yellow-pine lumber, which lasts longer than white pine. Besides, they are made stronger. Two six-inch boards and one four-inch, 22 inches long, are nailed on a two-inch cleat at each end, with nails long enough to be clinched. The narrow ⅜-inch side and back cleats are made out of box lumber. [Dr. Miller advises extra ventilation at the bottom of hives containing strong colonies, and in some cases he even goes so far as to place blocks under all four corners.—Ed.]

GLEANINGS FROM OUR EXCHANGES

By W. K. MORRISON

SHAFTAL (A NEW CLOVER).

Secretary Wilson, of the Department of Agriculture, in his annual report for last year makes the very interesting announcement that Prof. N. E. Hansen, one of his plant-explorers, has discovered in the valleys of the Himalayas a promising new species of clover which, it is hoped, will form a crop rotation for cotton. The department has under consideration other promising new species of clovers from Siberia and Central Asia, adapted to the climatic conditions of the Northwest. Among them are two new species of alfalfa.

VERY INTERESTING.

According to reports in the daily newspapers a case of peonage has been discovered at Argo, Ill. It is said that over one thousand men were held as *quasi* prisoners while at work there inclosed by a fence 15 ft. high. One man was shot while escaping from the stockade; six, however, effected their escape and reported to the United States District Attorney. An investigation will be made by the grand jury. Argo is fifteen miles from Chicago, and is said to be the property of the Corn Products Refining Co., who manufacture glucose on a vast scale.

SUNFLOWERS FOR BEES AND CHICKENS.

It is true, as Mr. Crane states, sunflowers are heavy pullers on the fertility of the land on which they are grown. But many poultrymen are so situated they can secure very easily great quantities of manure, as they are near cities or towns. Sunflower seeds should not be compared in value with corn, oats, wheat, and other common grains. They take the place of beef scraps, and are safer to use; and, besides, they cost less. The reason why our turkeys "run out" is due very largely, I think, to the want of the very rich diet which they get in a wild state. The wild turkeys naturally get a large amount of insects and rich oily nut food.

They require food such as sunflower seed, and also hempseed, to make good the loss of their natural food when they are kept in a domestic state. Of course, in summer time they get many insects in roaming over a farm; but they still lack the rich nuts of their native woods in fall and winter, and it is here where the sunflower comes in. For chickens I would rather feed sunflower seed than meat meal.

THE RECLAMATION SERVICE ATTACKED

That wonderfully able and excellent agricultural periodical, *The Country Gentleman*, of Albany, N. Y., has allowed itself the luxury of a tirade against the irrigation work now being executed by the United States government. It makes the grievous error of stating that the irrigation works are built at government expense, when it is a fact that the settlers bear all the expense, binding themselves to repay the cost in ten years. Furthermore, the funds which are being used as floating capital are obtained by the sale of public lands, so that the government is not out a cent. In addition, the farmers who reside on these irrigation projects live under almost ideal conditions, both as regards remuneration for their work and also socially. If the New York farmers could devise a similar plan for making themselves comfortable, doubtless Uncle Sam would be glad to step in and do the work in the same thorough manner he has thus far executed his irrigation works in the West. *The Country Gentleman* asks for the repeal of the irrigation law; but that would hardly do the Eastern farmer any good.

The object of President Roosevelt's "uplift" commission is to devise some plan for improving the farmer's condition, and it is quite possible a way may be found. Possibly the Eastern farmer would find a cheap supply of electricity on the farm a great benefit. If so, currents could be distributed in the same way water is supplied in the West. It is easy to see that several motors could be very usefully employed on a farm of ordinary size.

A BOOK ABOUT HONEY.

Mr. T. W. Cowan has supplied us with a book on the subject of beeswax. Now Dr. Alfred Hasterlik, of Munich, has undertaken to supply us with one on honey and its substitutes. Unfortunately it is written in the German language, and, though many Americans know that tongue fairly well, the most of us would prefer it in English. The title of the new book is *Der Bienenhonig und seine Ersatzmittel* (Honey and its Substitutes), and it goes quite extensively into the whole subject of honey and its adulteration.

It is published by A. Hartleben, of Vienna and Leipsic, who has issued quite a number of other books of a technical nature, many on chemistry, and, true to that mission, the present book is very strong on the chemical analysis of nectar and honey.

It also discusses the extraction of honey, and gives illustrations of the very latest designs in honey-extractors and honey-packages. The author has not hesitated to draw on the best American authorities, and shows illustrations of power-driven automatic honey-extractors. He also delves into the subjects of aroma, ripening, flavor, density, and other matters of importance where fine honey is desired. Adulteration is a leading subject, and the author seems to be well acquainted with all the tricks of the adulterator. There are a great many honey recipes, and he quotes freely from the pharmacopœias of the leading European nations. Any one in quest of information relative to foreign drinks, vinegar, honey-bread and honey-cakes, will find this book a very good guide. Books of this kind deserve high praise, for the information given in them is not easily collated; but the author of this, being a doctor of chemistry, and a bee-keeper at the same time, we have the opportunity of profiting by his researches at very little expense.

The price of the book is 3 marks, in Germany, which is equivalent to 75 cents in our money and 3 shillings in English currency. For a book of 232 pages, packed with technical information, this is a very reasonable charge, and we hope the publisher will be liberally encouraged with orders.

APRICOTS DAMAGED BY BIRDS; FRUITS THUS INJURED ARE SUCKED DRY BY BEES, WHICH STORE THE JUICE AS HONEY.

BEES VS. FRUIT.

The Birds and Not the Bees are to Blame; the Latter Clean up what the Former Destroy.

BY W. A. PRYAL.

The question, "Do bees destroy fruit?" has been pretty well answered in the negative long before this; still, there are some persons who to this day insist that bees are the guilty marauders. I have lived among fruits of various kinds all my life, and I must throw the weight of my testimony in favor of the bee.

The past season I watched with more than usual interest the destruction of the fruit of some Royal apricots that grew at one side of my apiary. Some of these trees furnished shade for many of the colonies. I found bees working on the fruit from morning until night. When fully ripe this fruit is luscious. There is, to my mind, no finer fruit than a fully ripe apricot, for it comes very near being as rich as the best grade of well-ripened honey, and the best of it is you can eat more of them than you can of honey.

In all my watching I was not able to find a single case where the damage to ripe fruit was started by the honey-gatherers. Many linnets were about, and they are a sore pest to the fruit-grower. In May they begin on cherries, which they slaughter badly at times, and they run through the gamut of tender-skinned fruits well into the fall. They usually choose the ripest and finest fruit for their prey. They seldom make more than half a meal of a poor or under-ripe fruit, but they simply dive head first, as it were, into the dead-ripe 'cots.

A fruit once opened by the birds is later set upon by the bees, and they keep up their toil until nothing is left but the skin and pit. And the bees might as well have such fruit, for once it is damaged by the birds it is useless for marketing. If it is not picked at once it begins to decay; and if not removed from an adjoining sound fruit, which it may happen to touch, the neighboring one will rot too. Thus it is seen that in such a case the bees are a benefit to the orchardist. And here let me mention that the birds do not feast on a fruit more than a single day. They seem to want fresh fruit every time they begin a meal. From this it is evident that a large quantity of apricots is ruined.

Pears, peaches, figs, and a number of other fruits whose juices are sweet, are cleaned up by the bees when first punctured by birds. Some varieties of plums are liked by these insects, especially the French prunes. Juice of fruit of the plum kind soon ferments, and I have been told by Mr. W. E. Stewart, of Danville, Cal., that he has seen thousands of bees at a time as tipsy as lords from quaffing of alcoholic plum or prune juice. This, no doubt, was a case where they were too "full of prunes." The gentleman I mentioned also stated that he and others noticed some years that, where bees filled up on the juice mentioned, they died, possibly of chronic alcoholism—poor things! He said several years his hives became much depopulated through this means. In my apiary I never noticed bees under the influence of the "drink habit," possibly for the reason they had no chance to become full of prune juice, as we have but a single tree of the French prune, though we have many varieties of plums.

Bees are fond of grape juice. I never heard of their getting drunk on it. It is possible that this fruit does not ferment as rapidly as the more slightly acid fruits. Bees clean up grapes rapidly when they are injured by birds or when they rot or crack after early and unexpected rains.

The half-tone here shown is from a photograph I made in August, when flowers were scarce. The fruit had just been pecked by birds, and it is from such fruit that the bees lose no time in harvesting the nectar-like sweets.

Twelve years ago when on a visit to a commission house in San Francisco I was given a sample of a rich jelly-like article from a five-gal-

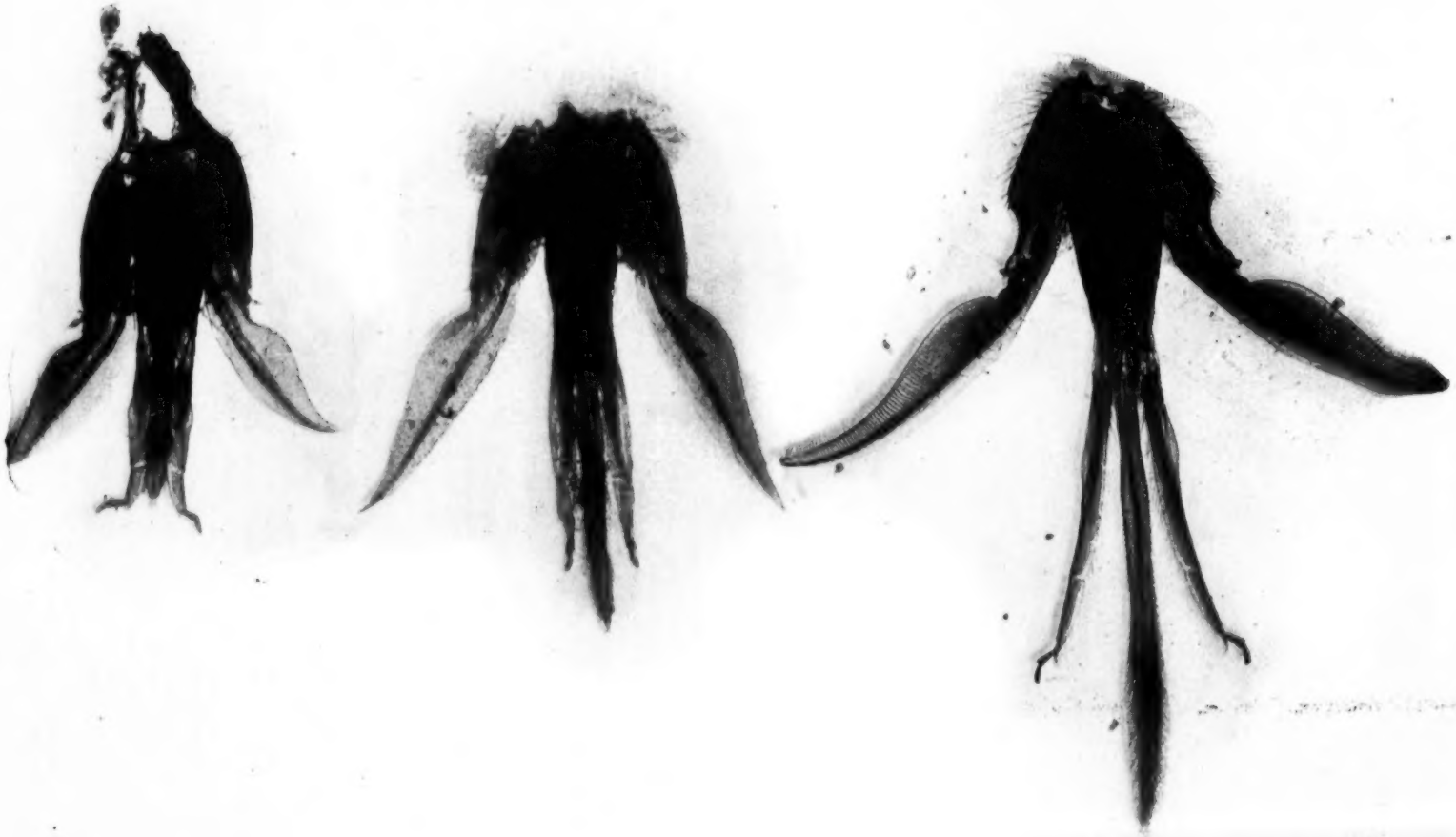


FIG. 1, *a*, *b*, *c*.—MOUTH PARTS OF THE QUEEN, DRONE, AND WORKER, MAGNIFIED 25.6 TIMES.

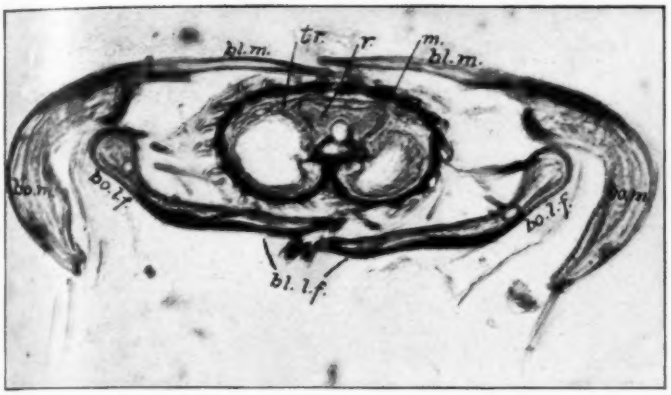


Fig. 2.—Transverse section of the mouth parts at the height of the first third of the lip-feeler; *tr*, trachea; *r*, rod; *m*, mantle; *bl. m*, blade of maxilla; *bo. m*, body of maxilla; *bl. l. f*, blade of lip-feeler; *bo. l. f*, body of lip-feeler.

lon can. I was asked to taste it, and state how I liked it and what I thought it was. I remarked that it resembled apricot jam with a slight honey-flavor. I was then told that it was apricot "honey;" that it was gathered by bees up the Sacramento River, where apricots were being dried. I should think the bees got the best of those 'cots. In such a case it behooves the apiarist to take his bees far off, or else for the orchardist to "kiln-dry" his fruit instead of sun-drying it, that bees might not swarm upon it and do too much damage by carrying off the juice. But seldom do we hear of any great injury of this sort.

Oakland, Cal.

THE MOUTH OF THE HONEY-BEE.

A Comparison Between the Corresponding Parts of the Queen, Drone, and Worker.

BY DR. BRUNNICH.

Every bee-keeper will be interested in a study of the mouth of the honey-bee; and without going much into detail I wish to show the differences in the parts of the mouth of the worker, queen, and drone. For clearly demonstrating those variations I magnified, by microphotography, the three different organs in the same proportion. Everybody can see that the development of the mouth of the worker is by far the most advanced. It will be well to explain briefly the more simple mouth parts of the worker; for to give an extensive explanation of the complicated parts would require the space of about two numbers of this journal, and would undoubtly annoy and tire most of the readers.

In the middle we see the slender tongue, which, on account of the great number of minute parts, is very flexible, as we all have observed when watching a bee licking a drop of honey. The tongue of the bee is not a simple tube, but an intricate structure, as we see in a section through the tongue, lip-feeler, and maxilla (Fig. 2). In the midst of the tongue there is the elastic *rod*, giving the necessary firmness. Enveloping the rod is the mantle, whose free ends touch each other, thus forming two channels on the sides of the rod. This mantle can be unfolded by the bee at will. The small spoon at the point of the tongue (Figs. 3 and 4) serves probably for *tasting*, and has certainly organs of taste.

On the under side of the tongue proper are the *lip-"feelers,"* which have feeling-bristles on the ends; on the upper side of the tongue are the *maxillæ*. The tongue, lip-feelers, and maxillæ may be shut like the blade of a knife, and are then imbedded in a corresponding cavity on the under side of the head. There is a wonderful snapping mechanism like that on a knife, but this is very complicated, and diffcult to explain. There are in the base of the tongue two springs, fixing the bent or stretched position of the three mouth-parts. One circumstance which complicates the mechanisn is this: The tongue, when it is bent (Fig. 4), is folded together on its base. By this the tongue is shortened considerably, so that in the folded-up condition the ends of the tongue, lip-feelers, and maxillæ are exactly the same height. Thus the length of the tongue does not hinder other work of the bee (building, chewing, etc.). It is, indeed, a wonderful mechanism.

Formerly, when a queen or worker was fed by another worker, I often asked myself whether the act were a passive or an active one. That is to say, does the queen get the feed by having it "poured in," or must she suck the feed herself. I now know that the latter is the case. The feeding bee bends down its tongue and opens its throat, pressing out a drop of honey or chyle, and at the same time the queen sucks the drop with the stretched tongue.

Comparing the corresponding parts of the mouth of the three kinds of bees, we are struck by the poor development of the tongue of the queen and drone, as compared with that of

Fig. 3.—End of tongue of worker, magnified 70 times.

FIG. 1, *a*, *b*, *c*.—MOUTH PARTS OF THE QUEEN, DRONE, AND WORKER, MAGNIFIED 25.6 TIMES.

the worker. The *free* portion of the tongue of the worker is 2.75 mm; of the drone, 1.6 mm, and of the queen only 1 mm. Also the lip-feelers and maxillæ of the worker are considerably longer than those of the queen and drone—about double the length of those of the queen.

Summing up we can say that the parts of the mouth of the worker are much more highly developed than those of the queen and drone, forming a strange contrast to the difference in the size and strength of the breast, legs, and wings of the three kinds of bees. However, we must admit that the perfection of the worker mouth is in full harmony with its function. We know that the bee is enabled, by the length of its tongue, to reach the nectaries of certain flowers, while neither the queen nor drone ever gathers honey, being nourished by the workers or else from the full cells in the hive.

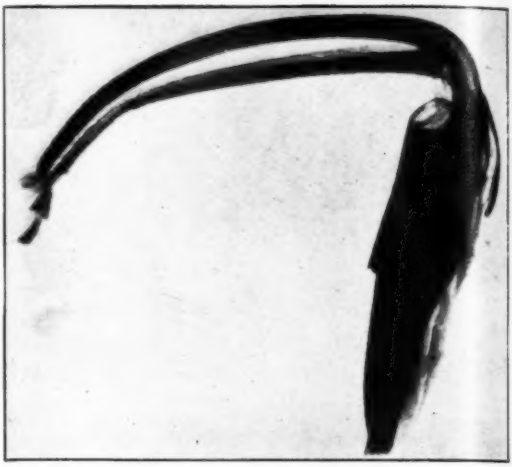


FIG. 4.—TONGUE AND LIP-FEELER BENT TOGETHER; MAGNIFIED 30 TIMES.

Let us still compare the upper jaw (mandible) of the three bees. Here the differences are still more distinct, especially as to the form of those parts. We admire the powerful upper jaw of the queen (Fig. 5, A), which resembles the form of the strong sawed mandible of the wasp or hornet, and which is not to be despised as a weapon. Both upper jaws form together a good pair of scissors, well adapted to the work of cutting the strong cocoon of their cells—a work which the worker-bees are generally unable to perform. With the point she penetrates the cocoon and continues with both upper jaws to shear it; I have often watched a queen at this work, and wondered, when I saw how quickly and neatly the young thing made its circular cut, turning itself about meanwhile. The cutting is so sharp that one must look very closely to discover it. I remember an experience I had years ago. A friend who had had an after-swarm gave me a number of queen-cells, each in a match-box; and when I reached home I was astonished to see that some of the cells contained no queen, though the top of the cell was well cut circularly. It was quite an enigma for me, because I did not yet know that the little cover often shuts itself after the queen has gone out.

On the base of the upper jaw we see a smooth round projection; this is the spherical condyle, which moves in a corresponding cavity in the head, thus forming a joint which allows movements of the upper jaw in different directions.

The upper jaw of the drone (Fig. 5, B) differs somewhat from that of the queen. It is not shorter, but slighter, and therefore a less powerful weapon. However, according to Pratt's observations it seems that rival drones often combat each other grimly enough. Like the queen, the

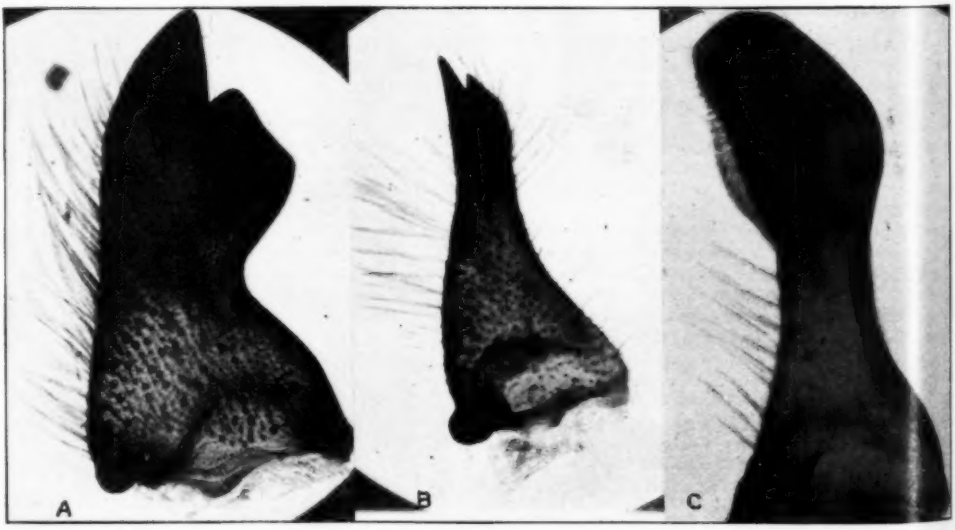


FIG. 5.—UPPER JAW (MANDIBLE) OF QUEEN, DRONE, AND WORKER, MAGNIFIED 51.7 TIMES.

drone uses its upper jaws as scissors in making a circular cut at the top of its cocoon (which is not quite as tough as the queen's). Every bee-keeper, early in the morning in May and June, has seen on the flight-board a number of those round little cappings when many drones have slipped out the night before. The hairs on the upper jaw of the drone are longer and lighter than those on the queen and worker.

The upper jaw of the worker (Fig. 5, C, and Fig. 6) is so different that one would think that it belongs to another insect. It is a tool shaped like a shovel, not of much use as a weapon, but constructed for various purposes. For instance, the upper jaws are used for comb-building, for removing pollen from cells, and perhaps for packing it in, as well, and for gnawing, etc. By means of them the worker opens its cocoon, not by shearing it, but by slowly tearing it to pieces. The jaws take the place of hands, for with them the bees carry out of the hive pieces of wax, crystals of sugar, dead bees, wax-worms, and all foreign particles; and with them the workers seize robbers, pull at the wings of strange queens, and battle with the defenseless drones.

FIG. 6.—HEAD OF WORKER, SHOWING UPPER JAWS OR MANDIBLES, MAGNIFIED 22 TIMES.

Considering the organs of the mouth of the three kinds of bees, we may admit that the tongue and accessories, as well as the upper jaws of the drone and queen, belong to a lower stage of development; and it is most interesting to see that those parts of the worker-bee have been improving, while the same parts have been stable in the drone and queen. Only the worker needs re- fined tools, and therefore only the worker has them. Evidently the mouth parts of the queen and drone are primitive forms, and those of the worker have improved from age to age.

The contrary takes place with the wings of the ants. Doubtless the workers also possessed wings at one time; but after a while the wing became superfluous, and even hindered, so that they finally disappeared.

Ottenbach, Switzerland.

FEEDING SYRUP IN COLD WEATHER UNDER THE CLUSTER.

Bees Carrying Honey into the Upper Story.

BY FRANK C. PELLETT.

The proper time to feed is in the fall, before the weather gets cold; but it sometimes happens that one must feed colonies purchased late in order to save them, or for other reasons. I prefer an empty super with a pan of syrup covered over with a light cloth to any of the feeders on the market for use at any season of the year, for, when placed over the bees, there is less danger from robbing than from an entrance-feeder. For cold-weather feeding we simply reverse the thing and set the empty super, in which is placed the pan of syrup, under the hive. With this plan the hive may be covered with the usual tar-paper covering. Of course, this plan or any other, for that matter, will not work in extremely cold weather; but in this latitude we get warm days occasionally throughout the winter, in which the bees may be fed if the syrup is ready, so that they need not be lost for want of stores. The advantage of this plan over the overhead method is that the cluster will form over the pan and the bees will hang right down to the cloth cover and take the syrup when it is much too cold for them to break the cluster and go upstairs after it. I have had the bees take syrup in this manner when it was too cold for them to fly. I think that much less heat is lost by lifting the hive off the bottom-board and placing over a super as above described than from any other way. The lifting of the cover in winter is especially bad, as the heat naturally rises to the top.

Perhaps a little unusual experience that we had in uniting this fall may be of interest. We had a swarm that was rather light, so we decided to strengthen it by adding more bees. A neighbor offered us his bees, from which he wished to take the honey, if we would take the job. His bees were in a chaff hive in which we wished to winter them, so we took an ordinary eight-frame hive full of empty combs in which to drive the others. We paid no attention to the queen, as there was no difference in the two so far as we knew, so we left the choice to the bees. On bringing them

home we placed them over the hive in which we wished them to winter, as we had always done before, expecting, of course, that they would unite with the colony below on the combs of sealed stores. All our experience indicated that they would go down, and all we have read of uniting by this method has been to the point that the two colonies will unite in the lower hive. In this case there seemed to be nothing else to do, as the lower hive contained the honey while this contained empty combs. I looked at them frequently, expecting to find the upper hive deserted and remove it; but, not finding it so, I decided to look below, and, to my surprise, I found that the bees had carried all the honey above, and the two colonies had united in the upper hive, leaving the lower one empty. As it was too late to transfer the frame we must now winter in the single-walled hive.

Perhaps such experiences are not uncommon, although I had not noticed such an occurrence before. I should like to know whether or not it does frequently happen that the colonies unite above, especially when the honey is below, as in this case. It seems to me that the stronger queen must have been present in the upper hive, and this must have been the determining factor in the case.

Atlantic, Iowa, Dec. 15.

[As a general rule, when two colonies of equal strength are put one on top of the other, the two forces will unite in the upper hive on account of the greater warmth; but if the lower hive has a lot of brood, and the upper one none, the bees will probably all occupy the bottom section.

We may lay it down as another rule, that, where two colonies, one a weak one and the other a strong one, are put together, one on top of the other, the weak one will go with the strong, whether it be above or below. In the case you have cited, the colony in the lower hive was weaker than the other; and the fact that, other things being equal, a lower lot of bees will unite with the upper one, would easily explain why both forces occupied the upper hive.

The tin pan and the piece of wet cheese-cloth make a most excellent feeder; but the cloth should be large enough to spread clear down over the edges of the pan, reaching to the brood-frames to afford a sort of ladderway to and from the feeder. If the cloth is just large enough to cover the surface of the syrup, the bees will have some difficulty in climbing up a sloping surface of the pan, although they will do it after a fashion.—ED.]

FANCY HONEY FROM BOX HIVES.

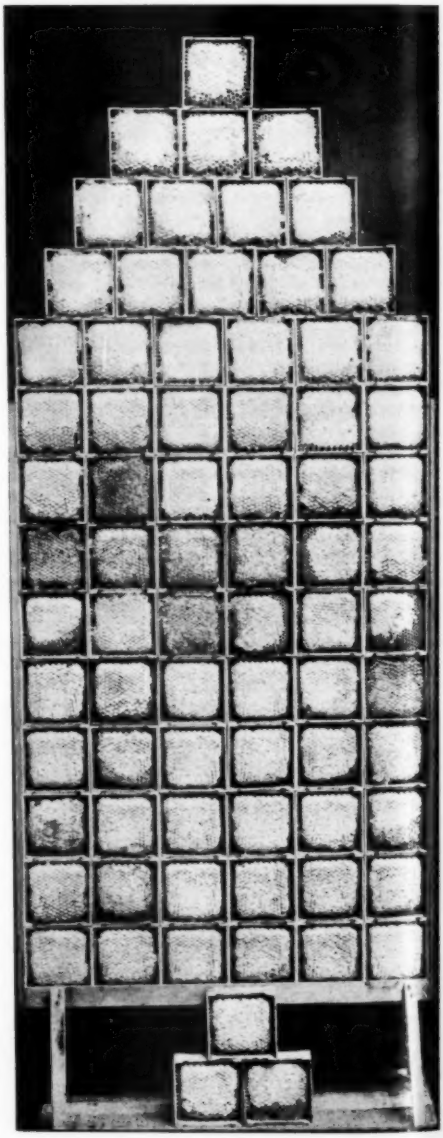
Four Swarms Clustered Together.

BY J. W. SPICKLER.

About the 20th of May an extra-large swarm issued from one of my hives and clustered in a cherry-tree in the yard. Before the bees were fairly settled a swarm came out of another hive and clustered with the first one. Then a third and fourth came out and all went together, making one mammoth cluster. I did not care to separate them, and so I dumped them into a dry-goods box. Later I took them out of the box and put them in a smaller one, 24 inches long, 23 inches wide and 5 inches deep. I used 15 pieces of lath instead of frames, with a quarter-inch starter of foundation on each one. Right after this I put on a super containing 55 sections, and these were filled, as shown in the engraving, in about thirty days. I put on another super containing 40 sections, but only 21 of these were filled when the honey-flow ceased.

This big colony in a box is in good shape for winter at the present time. I did not kill any of the queens when I hived the bees. There is from eighty to one hundred pounds of honey in the hive now for winter stores.

Columbiana, Ohio.



COMB HONEY PRODUCED BY A COLONY IN A BOX HIVE.

COMB HONEY VS. EXTRACTED.

Amount of Honey Consumed by the Bees in Building New Combs not Important in the Discussion; Wax Secreted Involuntarily; Extracted Honey More Profitable for Slow Flows; Wax Produced for Market.

BY R. C. AIKIN.

Continued from last issue, page 24.

Almost every one knows that, during slow flows especially, if a few sections are put into a super as baits it is a great inducement for a small cluster of bees to gather on them; and the bees in that cluster soon deposit some nectar in the empty drawn combs of such sections, and after this the greater force of the bees below follow, so that work in the super is started in earnest if there is any honey-flow to justify it. It is, therefore, unquestionably true that extracting-combs have the advantage in getting work started more promptly.

This is a problem that taxes the skill of the apiarist. If the colonies are weak, or if the flow is light, the bees will not promptly enter comb-honey supers. A brood-nest clogged with honey will not only curtail the amount of brood, but will encourage swarming, sulking, and loafing. Many plans have been proposed in order to force the bees into the supers, the chief one being to have the colonies so populous that the workers must go into the supers or else get outside the hive; and if they loaf or cluster in the supers they are almost certain to work there if stores are being gathered.

Now, suppose the apiarist knows his business well enough to get the bees started in the comb-honey supers as promptly as in extracted-honey supers; why should there be any more extracted honey produced than comb honey, granting that the wax secretion and comb-building principles, mentioned in the first article, are true? With ordinary skill and management there will be a *small* gain in favor of the extracted honey. On the other hand, if the apiarist allows swarming, or if he divides too much, or allows weak colonies to be run for surplus, there will be a more marked difference in favor of the extracted honey. In other words, if the man handling the bees is not their master—if he runs them on the hit-or-miss plan, and allows them practically to manage themselves while he simply puts on and takes off supers, then by all means he should aim to produce either extracted or bulk comb honey.

THE COMPARATIVE RESULTS IN HONEY.

When plenty of storage-combs are placed above a colony, and the storing in them is once started, it often happens that almost all the honey goes into these combs. A small brood-chamber, a strong laying queen, or both together, will most surely result in the honey being placed above and all the brood below. This is an ideal condition if a late flow follows; but if practically all the honey comes from one flow, and a dearth follows, then, when there is such a mass of brood below and the honey above taken off and sold, feeding must be resorted to or the bees will starve before the next spring. We may say in general, therefore, that, where the amount of extracted honey produced is much in excess of the possible amount of comb honey, the foregoing is the result. I have destroyed hundreds of colonies in just this way, and in the end was the loser because I paid most dearly for the extra number of pounds of honey sold.

Divide an apiary into two parts as nearly alike as possible, and run them side by side—one for extracted and the other for comb, giving each the same care in every respect throughout the year. Keep strict account of the number of pounds of surplus, and then invoice at the end of the full year—that is, just before the beginning of the next honey-flow; or at the close of the honey-harvest weigh the surplus from each and the amount of stores remaining. It will be found that the extracted-honey colonies are the lighter in stores and the heavier in brood. This extra amount of brood without a later honey-flow will mean that the queens will be worn out, and the colonies will not winter well unless fed.

If the apiarist desires to obtain the most surplus with the least expenditure for skill and care he had better run his bees for extracted or bulk comb honey. Furthermore, during the seasons when the honey-flow is very light the extracted honey can be obtained when it would be impossible to obtain a surplus of comb honey, and if any at all were obtained it would be of an off grade unless the greatest care were exercised. My judgment is that, all things considered, there can be but little more extracted honey produced than comb when the bees are left with sufficient stores, and the proportion between the two becomes more nearly equal as the skill of the apiarist increases.

The first and main thing to be considered is the relative cost of production; for when we have the cost price we can tell for ourselves which kind we ought to produce by comparing this cost price with our selling prices. Then it is well for every bee-keeper to experiment with both, for it is true that one person may fail producing one kind of honey while the next fails in producing the other kind. It is also true that local conditions make a decided difference. Let me illustrate this point by mentioning some of the conditions as I have found them.

HOW LOCAL CONDITIONS AFFECT THE PROBLEM.

When I first came to this locality, eighteen or twenty years ago, we obtained almost the whole product of both surplus and winter stores from one alfalfa-honey flow beginning about June 15th and lasting from four to six and sometimes even eight weeks. Under these conditions we had to make a strenuous effort to get all the colonies in the very best shape possible for this flow, and then the bees had the rest of the summer to get themselves ready for winter. In those days, if I could start the bees to working promptly in the supers, and keep them from sulking, there was but little difference in the results in the comparative yields in colonies run for either comb or extracted honey, although this difference, such as it was, was in favor of the extracted-honey colonies.

This, however, is now changed. In the good old days alfalfa hay was cheap, and many of the fields were allowed to stand in full bloom for two or three weeks. There were but few bees in the country to work on it, and large yields were obtained. Now the farmer watches his alfalfa, and usually cuts it when the first bloom appears, and

this greatly reduces the season of bloom. In addition to this there are many more bees in the country. While these changes have been taking place, a demand for a finer honey has sprung up. Sweet clover has also increased, practically changing the season of flow from June and July to July and August. The alfalfa rarely fails to give *some* honey in June and July, perhaps just filling the brood-chamber, making possible, sometimes, work in the supers, but usually the flow during June and July is slow and of such a nature that the brood-chambers become badly clogged with honey, and it takes the utmost care with strong colonies to get any satisfactory work in comb-honey supers, and at the same time the rearing of brood is curtailed that should give the proper force of bees for the sweet-clover flow, which is the greatest from August 1st to the 20th. We therefore have to scheme and strain every nerve to get the supers finished which were started, perhaps, in June and not completed before August. When the flows are so slow and intermittent, the apiarist has to be an expert to make a success of comb-honey production under conditions when the total yield does not average over two supers per colony in the whole two months. Then with all the other troubles the swarming problem has to be met in comb-honey production.

I like to produce comb honey for various reasons, especially because it is quickly marketed, and the quicker the honey is marketed the better; but with these long slow flows, and after weeks and weeks of vigilance and care, it is rather discouraging to find great piles of sections either not used at all or only partly filled. There seems to be at all times sufficient wax secretion, and bees enough to do the building of all the comb necessary to receive the honey gathered. Under these conditions I have for several years contemplated producing extracted honey; and not only that, but to let each colony build new comb each year, save one or two bait-combs to entice the bees into the supers, and then make wax of all surplus combs.

THE COMPARATIVE COST OF COMB AND EXTRACTED HONEY.

It requires as a first outlay a little larger investment for the extracted-honey equipment; but this equipment is permanent, and does not have to be renewed every year. In comb-honey production the work piles up all at once, and can not be neglected. An extracting-super may be left on the hive indefinitely, and it may be only partially filled or clear full, while the comb-honey supers, on the other hand, must be carefully looked after or there will be a great many unfinished sections to melt in making the expensive *strained* honey.

I believe there is but little difference in removing the two kinds of honey. It costs about as much to scrape and case comb honey as to render, extract, and pack extracted honey. The extracting-supers themselves are perhaps a little less expensive than comb-honey supers; but both are permanent investments, and nearly balance. However, when I count the sections to be bought for each crop as well as the foundation, etc, there is a cost of at least one cent a pound on comb honey that does not have to be figured on extracted honey. Final packages for each approximate about the same value.

There is more than this to consider, however. Extracted honey should never be produced unless it is largely capped, and the wax from the cappings will just about pay for the expense of extracting Several years ago I had some estimates on this point, but have forgotten the details, as I have so little to extract of late. Any way, the amount of wax obtained varies, depending on how much the combs are bulged and on the amount of burr-combs. It must be remembered that beeswax runs into money fast, and needs no expensive packages, and is not nearly so perishable as honey.

Now, suppose we melt three out of four extracting-combs, retaining the fourth for a bait-comb. On the basis of 4 lbs. of wax to hold 100 lbs of honey, and with wax at 25 cts. per lb., we have the proportion of 75 cents' worth of wax to the 100 lbs. of honey. I think that extracted honey, and the cost of labor of producing, and packages up to the time it is ready for shipment, costs fully 2 cts. per lb. less than comb honey. In addition to the cost, the management necessary for extracted honey is easier, and less skill is needed, and the honey when gathered is less likely to be injured, can be kept indefinitely, and may be shipped more safely. If so desired, the extracting may be left to any convenient time after the harvest is over.

I have mentioned the fact that the first equipment for extracted honey is greater than for comb, but it is serviceable for years. With comb-honey production one must put money into sections and foundation every year without knowing whether there will be any use for them; but with extracted-honey production there is no need of spending a cent for cans, etc., until the honey is actually in sight. Furthermore, because of the greater ease in controlling swarming, and the less amount of attention given to the details of management during the season, one can handle a greater number of extracted-honey colonies, and thereby materially augment his gross earnings, at least in the number of pounds produced. In localities where honey does not candy rapidly, it is not necessary to extract until some time during the late fall or winter, thus giving the whole time to producing through the summer, and leaving profitable work for the winter.

I wish to call attention again to the fact that wax is very valuable, and that much of it can be produced when colonies are run for extracted honey. Great quantities of wax are lost each season if the bees are not allowed to use it in building comb. The bees use it for other purposes if there is no comb to build. When scraping sections I save the scrapings, which appear to be almost entirely propolis; but when melted they yield considerable wax. Then I have many times seen nice white wax used to fill cracks about comb-honey supers; and when there are full sets of combs already built to hold every drop of honey to be stored, I have found workers loaded with wax scales, cracks stopped with wax, burr-combs put here and there without stint, and, when not needed, bits of wax built against the quilts over the top-bars, sometimes amounting to a quarter or even half a pound—all this apparently done just to get rid of the surplus wax by using it where propolis would ordinarily be used. If the colony clusters outside the hive the bees will

put little knots of wax even on the hive-walls. So far I have said nothing about wax scales that may be dropped. We can not see these, because the bees of a strong colony will not leave any sort of chip of wax or any thing else where we are likely to see it. I think that burr and brace combs are the richest in wax of any thing we get wax from, and they are evidently built, at least partly, to get rid of the surplus.

I know that I am going contrary to popular opinion, but I have simply told the results of my experience and observation. Ready-made combs, during a rush of honey which comes on suddenly, are valuable, but otherwise they should be used only as baits.

In producing extracted honey I should use a brood-chamber of ten or twelve frames instead of an eight-frame brood-chamber when running for comb honey, in order to prevent robbing of the stores.

Loveland, Col.

[Our correspondent has struck on a very important topic, and one that should merit not only careful thought but extended discussion. It involves the problem of the production of wax for market. It has been generally assumed that the bee-keeper outside of the tropics can not afford to produce wax in place of honey; but as editor of GLEANINGS we see in our general correspondence a tendency toward the feasibility of producing wax for market instead of honey alone. It is one of those questions that will not down; and *if* wax is produced involuntarily, and *if* in the production of comb honey a large amount of natural wax is lost, then producers should stop and think.

You will notice in the foregoing that we have put the two *ifs* in italics, for we would not at this time go so far as to make the positive statement that wax is produced involuntarily, whether it be used in comb-building or not; but we are anxious to get hold of additional data that may have some bearing on this question.

If we mistake not, the Apicultural Expert, Dr. E. F. Phillips, in the Division of Entomology, Washington, D. C., has been giving this matter some attention. If so, some bulletin will doubtless have some important data that will mean much to bee keepers.—ED.]

MOVING BEES SHORT DISTANCES.

Does it Pay to Move Colonies Two or Three Miles and then Back Again to a Desired Location?

BY CAREY W. REES.

It is necessary for me to move an apiary about 40 rods; and as we are not likely to have cold weather here to keep the bees in the hives more than a few days at a time, I have been at a loss to know just how to proceed.

Some time ago it was so cold that the bees were not flying, and I moved ten hives. The next day was cold, and only a few bees flew; but some that did fly returned to the old location, and after a short time entered hives near by without loss by fighting. The weather continued like this for three days, and then came a warm day, and the bees flew as in summer time. More bees returned than before, and entered other hives; but as I did not think those were much loss, or not enough to warrant me in moving the bees two or three miles, and allowing them to stay for two or three weeks, and then move them to where I want them, I concluded to try the plan again, which I did when the weather was warm and many bees were flying; but I don't think that any more bees came back than before, and nearly all returned that did come within a few hours, as nearly as I could tell.

To-day I moved ten more hives, and let the bees remain shut in until noon, then opened and left them fly; but I smoked these last ones well a number of times. I do not know whether any of these returned. If so, it was only a few. This was a very warm day, and the bees were flying as in summer time and carrying in pollen. I do not know if they are getting any honey or not; but a neighbor told me a few days ago that his bees were getting a little honey. He said that he caught some of them and found sweet nectar in their honey-sacs.

How can any one tell to a certainty that fewer bees are lost when moved two or three miles than when moved a quarter of a mile, as the ones that are lost in the field are not seen? What means have we of knowing? Since they must be familiar with all the territory within a radius of two or three miles, isn't it reasonable that they could as easily return that distance as a quarter of a mile?

Lytle, Texas, Dec. 15.

[Hives of bees can be moved at any time of the year; but where they are moved less than half a mile there is sure to be more or less returning of the old bees. In the fall, after cold weather has set in, there will be much less of this returning than during the early part of autumn when the weather is warm. In your case, or in any locality where it is likely to turn warm every few days, we would advise putting the bees to be moved down cellar during the coldest part of the winter, and keeping them there about six weeks. They can then be placed in any spot desired.

You ask how it can be known that bees will return when moved a short distance, more than when moved a long one. Very easily by weighing up the colony. As bees do not ordinarily fly more than one and a half or two miles, if they be put in an entirely new location they will remark their new home by taking note of every thing in the vicinity. If we move baby nuclei, containing only five or six hundred bees, two miles or more they will hold their strength after being moved; but if they be carried only a short distance, these little boxes will be more than likely to be pretty well deserted in twenty-four hours unless these little clusters are formed of several lots of bees mixed together.

As a general thing, bees are not familiar with territory more than a mile and a half distant at the most. Probably a mile will cover 95 per cent of their range of flight.—ED.]

THE ALEXANDER PLAN INDORSED IN ENGLAND.

I have found that Alexander's method of strengthening weak colonies by placing them over strong ones answers very well.

Bedford, Eng., June 3. F. W. MOORE.

HEADS OF GRAIN

FROM DIFFERENT FIELDS

COMB-HONEY GRADING-RULES; A CRITICISM.

I wish to take exceptions to the editor's note on page 1316, Nov. 1, in reply to the article by J. C. Davis on grading comb honey.

We have been trying to educate our brother bee-keepers so we might improve our grades in comb honey. The illustration is marked "properly graded honey." In the first place, no illustration should ever be published showing as much unsealed honey in any grade.

In the second place, I fail to see where the illustrations fit even the Eastern grading-rules, and I claim that such cuts are misleading to amateur bee-keepers.

For several years I have had trouble with bee-keepers who have shipped honey with me in car lots, who tried to grade their honey by the rules published in GLEANINGS. We western bee-keepers believe that the fewer grades we have the better, as long as all the honey is covered properly. As the editor says, we get so small a precentage of so-called "fancy" honey that we have no use for the fancy grade. At the last annual meeting of the Colorado State Bee-keepers' Association we revised our grading-rules, and included another grade called No. 1, light amber. Our rules in regard to this require the same weight, proper cappings, etc., as is required in No. 1 white. In fact, it is No. 1 honey in every way except that it is slightly off color. We believe that no honey should be placed in the regular grades that has, besides the outside row, more than 25 unsealed cells.

N. L. HENTHORNE,
Sec. Colorado State Bee-keepers' Association.

Platteville, Colo., Nov. 23.

[If the reader will turn to the Colorado grading-rules published occasionally at the head of our Honey Column elsewhere he will understand better the arguments of our correspondent.—ED.]

ALEXANDER'S BEES DO NOT REACH ALL THE BUCKWHEAT IN THE LOCALITY; THE MATTER OF OVERSTOCKING IN A BUCKWHEAT COUNTRY.

I think Mr. Orton's ideas, page 1504, Dec. 15, are entirely correct in regard to the amount of buckwheat reached by Mr. Alexander's bees being greatly overestimated. I'm something of a walker, and during my spare time in the two seasons I worked for Mr. E. W. Alexander I traveled the roads in every direction around Delanson. I think not a tenth of the land in reach of his bees was ever sowed to buckwheat in one season, and most of this was of the poorer Japanese sort.

I believe that the number of colonies that can be kept in one locality has been greatly underestimated. I now have about 150 colonies here; and around me within a four-mile circle are more than 1200 colonies belonging to my neighbors. In spite of this, I got more honey per colony than did any of my neighbors that I know of, and some of them had twice the amount of buckwheat and not a quarter of the bees. I even beat the Alexanders a little, though their big yard ten miles away by road was second.

Mr. Orton was wrong about the Alexander honey-tanks, as each tank holds only *two* tons or about eight tons in all. They are hardly large enough, as it takes a two-ton tank to ripen the honey properly from 150 extracting-supers in a good honey-flow.

R. V. COX.

Sloansville, N. Y., Dec. 21.

[When we visited Mr. Alexander, some years ago, he said he had found some of his bees, which he traced by the line of flight back home, in buckwheat-fields three and even five miles away from his home. Ordinarily bees do not fly that far; but he said that, in a hilly country such as he had, they would fly further across valleys than over level country or through woods and underbrush. It was not difficult for us to understand *why* 750 colonies could be supported in one apiary, when Mr. Alexander offered this explanation.

We remember also how Mr. Alexander pointed out fields that were some three miles away, and some even five miles. As his apiary was located on a hill, the bees, if they have long distance vision (and he thought they had), could see these white patches, and naturally go to them as fast as the nectar supply in nearby fields was taken up.

Then another fact that he gave us was that his bees undoubtedly gathered a very large part of the honey from asters, which were in bloom about the same time.—ED.]

HOW DID THE QUEEN GET IN THE OTHER HIVE?

Wishing to add more rapidly to my small apiary I bought two colonies of bees June 18th. One of them did not increase, and upon examination I found that the bees had four combs drawn out, but no signs of queen or brood. I waited two days and went through the hive again very carefully, but could find no signs of a queen; but there was a capped queen-cell on one of the combs; and, being curious to see the inside, I clipped the end of the cell off but there was no larva inside. The queen-cell was surrounded by about fifteen drone-cells containing larvæ, which I would think indicated a laying worker, although there were no eggs nor larvæ in any of the worker-cells.

I cut out these cells and introduced a queen in the usual way, leaving her in the cage three days before releasing her. The minute she crawled among them they balled her. I put her back in the cage and tacked a thin piece of pasteboard over the hole in the cage, but at the end of two days they had released her and killed her.

I gave them a frame of brood from another hive, but they refused to raise a queen. I then gave them three capped queen-cells from another hive, but they immediately cut them out.

In August I had a very large swarm come off another hive, and after hiving it I placed it by the side of the queenless hive that had been tearing down the cells, intending to unite them in a few days. Three days after, I proceded to unite the two colonies; but when I opened the queenless hive I was surprised to find just a small handful of bees with a queen, also a number of the brood-cells containing eggs.

I immediately closed the hive and carefully went through the swarm that had been placed

next to it, but could not find the queen. I then took the brood-frames out of the hive containing the queen and handful of bees and placed them with the swarm, and you never saw a more contented lot of bees, not one of them offering to fight.

1. Why did the queenless colony accept the queen from the swarm when she crossed over (which she evidently did)?

2. Why did she go to that hive? Was it to use the brood-frames drawn out by the queenless colony?

3. Why did the bees in the queenless colony go to the new swarm except the handful that stayed with the queen? WILLIS N. ZEITLER.

Punxsutaney, Pa., Dec. 4.

[The probabilities are that the first hive to which you refer contained laying workers; at all events, the behavior of the bees toward the queen and queen-cells that you gave them is quite in line with what such a colony might do, although as a rule it will accept cells. The swarm that you put beside the laying-worker colony was probably much stronger numerically; and such being the case it would absorb the bees from the weaker colony. When two colonies are set side by side, it generally happens that the stronger will draw from the weaker. The former will make the bigger demonstration in front of the entrance. The mass of bees in the air has a tendency to go to the colony where there is the strongest flying. In the case under consideration it is not at all strange that the laying-worker colony became weaker and weaker.

It is not easy to account for the fact that the queen of the swarm should desert her old colony and go into the other. It may have happened somewhat in this way: The swarm, after you placed it beside the other, came out unknown to you, and returned. But the queen, by mistake, went into the wrong hive, that is, went with the laying workers. If their hive at the time was very largely depleted in force, the remaining bees would probably accept any thing in the shape of a queen; for it is much easier to introduce to a weak stock than to a strong one. Again, it is true that a colony will sometimes refuse to accept a caged queen, but will take one that goes into the hive by mistake. Why this is so, we can not explain. Colonies are like persons. Some of them have queer freaks, and will at times do any thing contrary to all rules and precedents.

Your questions we have already answered in our general statement.—ED.]

NO DANGER IN GROUPING COLONIES CLOSE TOGETHER FOR WINTER.

On page 1427, Dec. 1, a correspondent of Mr. Doolittle proposes to winter a number of colonies together, with the hives set so close that they touch each other, except the entrance part, which will face outward, packing underneath, on top, and all around the whole with chaff or carpet, so that the heat of the whole will keep all warm and at an even temperature.

This is an economical way to get all the advantages of double hives, as I assume, from the entrances facing outward, that they are to be left open for the winter. The heat from adjoining colonies would hardly affect any seriously, as I have placed my hand under the top cushions of several hives in freezing weather, and found it hard to locate the cluster by the warmth; and even if a colony gave out much heat, the experiments of Mr. Geo. W. Phillips, which appeared in GLEANINGS some time ago, would show that a colony can be entirely surrounded by a temperature of 70° and winter successfully, when the entrance is open, thus giving good ventilation.

A windbreak would be a necessity, though, on all sides but the south, in this locality. By placing the hives in two rows a few feet from the south side of some building, one row facing the north, back to back with one facing the south, the use of windbreaks might be avoided. It might be a good plan to place a half-story or super with chaff or cushion in it on each hive, then place the next tier. The confusion of the bees when their location is changed in fall and spring is the greatest difficulty to be overcome and determine as to whether the plan is practicable or not.

Elyria, O., Dec. 19. W. J. MILLER.

[The greatest objection to this grouping plan is the confusion when the hives are placed on their summer stands. In spite of this there are some prominent bee-keepers who winter this way. The heat of the cluster in cold weather is not very pronounced.—ED.]

HOW MUCH DOES A DEALER MAKE ON HONEY?

I should be pleased to have you give me some idea of how much a merchant generally makes on a section of honey. If a section is retailed at 20 or 25 cts., what would be a fair price for a bee-keeper to receive? There is so small an amount of honey raised here that we know little about it at home. The honey shipped in is not liked because of the condition it arrives in, and there is not much shipped in any way. I always get a good price for my honey, but have taken different prices, as some merchants, before knowing the quality of the honey, pay less than others.

Farris, Wash. MISS ANITA A. BYERS.

[Some years ago it was figured out at a convention that honey sent to the city on commission, and selling at 15 cts. per lb., would net the producer only 10 cts. The 5 cts. was supposed to cover freight, drayage, leakage, and commission at 10 per cent. If the dealer or the one who sells to the consumer pays 15 cts. he will sell that same honey for not less than 18 cts., and he may get 25. Much will depend on the market, and whether the dealer has a fancy trade or an ordinary country trade.

Where a producer can sell locally we advise him not to send honey to the city, but take it around to his own grocers. From these people he can get 15 cts., if he can get any thing, providing the honey is No. 1 or fancy. If it is a country store, such honey will sell to the consumer for 18 or 20 cents.—ED.]

A TARIFF ON HONEY AND WAX NOT FAVORED.

I am sorry that the Detroit convention recommended a higher tariff without a general discussion of the question, because there is at present a tendency to recede rather than to advance from the extreme stand generally held in this country. Judging from effects in general, the almost cer-

tain advance to consumers of wax and honey and products of which they are a part, the adjustment to new conditions which the change in rates implies, and the doubtful utility of the tariff itself to accomplish the desired results, I would most respectfully record my vote against any raise in rates.

Those who advocate a higher tariff ostensibly for the purpose of excluding diseased honey and wax are open to suspicion, inasmuch as the exclusion of unwholesome and dangerous substances may easily be controlled in our imports without a tariff; and, like beneficiaries of tariff in general, they wish to conceal their intentions under the cloak of public welfare. They keep our eyes on the dangerous germs of foul brood while they quietly abstract from the public 5 cts. on wax and 2 on honey, and this, too, while we are trying to get the people to consider our honey a desirable, cheap, and wholesome food.

Ann Arbor, Mich., Dec. 3. E. G. MANN.

MEETING OF THE CHICAGO NORTHWESTERN BEE-KEEPERS' ASSOCIATION.

An exceedingly interesting meeting of the Northwestern Bee-keepers' Association was held at the Briggs House parlors, Chicago, Dec 2 and 3. This association represents territory in Indiana, Illinois, Wisconsin, and Iowa. It was largely attended by the bee-keepers of Cook Co., of which there are upward of a thousand in the county and three hundred inside the city limits of Chicago.

On the subject of the control of the price of honey, many deprecated the practice of selling the crops at whatever price might be offered. One man told of the sale to a Wisconsin grocer of a large amount of the finest kind of white-clover honey for 10 cts. a pound. The plan of communities of bee-keepers organizing to control prices in their vicinity was advocated. One bee-keeper told how he and two others had made and kept an understanding as to prices, and how each, year after year, had disposed of the crops without any undue sacrifice. Another member told of the sale of 50,000 lbs. of honey in one town. There had been a distribution of not less than 2 lbs. per capita at fair prices.

Mr. Whitney, of Evanston, said that there never would be any great improvement in this matter until the bee-keepers of the country are brought into the associations, induced to attend the meetings, and constantly take and read a bee-paper, so that they may be enlightened as to profit-making in the industry. Ignorance was thought to be at the very root of such matters, and this ignorance must be cleared away by the work of the men and women who are working members of associations and readers of bee literature. The crying need is to get the apiarists, or, rather, men and women who are bungling the business, to get into the bee-keepers' fold.

The meeting voted, through a resolution, to ask the legislature of Illinois to pass a law to govern the conduct of apiaries to the end that dreaded disease may be prevented, cured, or entirely wiped out.

The care of colonies in winter was discussed. Some of the men who have built commodious houses in the suburbs, and have an abundance of basement room heated by furnaces, are making use of such wintering places, the temperature being closely regulated. Many of the old bee-men are still keeping their bees outside, making use of leaves in one of the supers, and leaves to bank up to keep the bees warm and dry. Some of the city bee-keepers are already making use of cement for hive-stands. Cement blocks set flat and solid on the ground are now in use.

Ravenswood, Ill. J L. GRAFF.

WHAT WAS THE CAUSE OF THE LOUD HUMMING OF ONE COLONY IN THE CELLAR?

A few days ago I went down cellar to see how the bees were getting along, and, to my surprise, I heard a loud humming in one of the hives. The entrance was covered with wire cloth so the bees could not get out. I carried the hive out of the cellar so that the other bees, which were very quiet, would not be disturbed, and placed it in an out-building, and there it stands, with the bees still trying to get out.

The colony is about as heavy as when I carried it down cellar, and I think the hive contains plenty of honey. The whole thing weighs something like 45 lbs. Every thing is nice and dry about the hive, and I surely don't know what's the matter.

The cellar is very dry, and the temperature is about 50 or 55. O. E. SUNDRY.

Zumbrota, Minn., Dec. 26.

[Some colonies will bear being shut in a bee-cellar with wire cloth over the entrance, and others will not. In the average cellar it is our opinion that it is far better to leave the entrances open just as they are used during summer. If you had removed the wire cloth from the colony that made the loud humming the bees would have subsided, probably. Under the circumstances we would advise you to remove it at once, no matter where you keep the bees.—ED.]

SEALED COVERS VS. ABSORBENT CUSHIONS.

Why do you recommend sealed wooden covers over the frames, with packing above, for wintering, while Mr. C. P. Dadant holds exactly the opposite view, viz , that absorbing cushions should be used? See his article in last issue of the *American Bee Journal*. W. F. COX.

Garden City, Mo., Dec. 12.

[We recommend sealed covers to the average bee-keeper because such persons will secure better results than with absorbing cushions. While Mr. Dadant may be able to do better without the sealed covers, it is our opinion that bee-keepers as a rule will do better by having the top of the hive sealed, and covered with warm packing We have worked both schemes at our yard here at Medina; and while some years the absorbing cushions gave the better results, yet year in and year out the sealed cover comes out ahead.—ED.]

ALSIKE AND RED CLOVER NOT KILLED BY DROUTH, BUT WHITE MAY BE AFFECTED.

We had a bad season after the first of July, for there was no rain from the first of July until the middle of October—about one hundred days. We are having some rain, but the ground is wet only six or eight inches deep. I thought

the alsike clover was dead, but it is greening up somewhat. Red clover is all right; but I am afraid the white is dead.

My bees were run down in numbers, and short of honey; but I doubled up and prepared 16 stands for winter. I tried the paper plan in uniting automatically, and found it works well. I moved colonies from anywhere in the yard, and never lost a bee. This was during the first of October, when it was very warm.

RALEIGH THOMPSON.

Underwood, Ind., Dec. 7.

[We think you will find the white as much alive as the other clovers next spring.—ED.]

SUMMER DROUTH, NOT FALL, KILLING CLOVER; "NOT MUCH ROOM TO COMPLAIN."

I notice in your Christmas issue that you desire to get more reports as to whether drouth in the fall kills clover. Mr. J. B. Hall, of Woodstock, Ont. (who, I am sorry to learn, has suffered a paralytic stroke, and may not be able to reply to your request), has always been looked upon as one of our best Canadian authorities on bees or any thing pertaining thereto, and I heard him state at a convention that "it is in August that clover is killed through drouth." The last rain that we had of any account was during August (I mean in Stratford district). We had a terribly dry fall, but the clover looked fresh and green, although very short. As to my own judgment, I don't think that white clover will either winter or spring kill; but both alsike and red will spring-kill if the ground is bare and the weather sunny with frosty nights. In the day time the sun melts the frozen ground, and it falls lower in the roots of the clover; the frost at night hardens it up again, and, swelling as it freezes, it takes a fresh lift at the clover and holds it there. Next day and following night the process is repeated, and so on until finally it is sticking up beyond hope. In the absence of snow this danger could be prevented by a slight sprinkling of straw.

A JOKE ON A. I. R.

That's a good picture of the Detroit convention, but your father reminds me of a man who was riding in a street-car, when two very fleshy women came in and planted themselves, one on either side of him. Presently the conductor came along, and, happening to know the gentleman in question, queried, "Hello, Jack! how are you getting along?" Jack glanced to the one side, then to the other, and finally replied, "Well, I haven't much room to complain."

Poole, Ont., Dec. 31. DAVID CHALMER.

DROUTHS KILL GRASSES, ETC., THAT TEND TO CHOKE WHITE CLOVER.

White clover grows in old pastures and fence-corners in competition with red-top, June grass, and the like, and its prosperity depends on what helps or hinders it in getting ahead of these other plants. If a great fall drouth like the present killed a large per cent of both kinds of plants and prevented the grasses from starting from seed in the autumn, they would start anew in their rivalry in the spring. But every one knows that the clovers have the grasses "skinned a mile" when it comes to sprouting and growing in the spring from seed. In a field of ours I think I can notice a decided gain of the grass, due to the two successive wet falls in the past; while dry weather late in the season, some years before, tended to help the clover.

The white clover I find under the snow to-day seems as much alive as one could expect it to be; and I do not believe it could be whipped out except by a great midsummer drouth followed by heavy rains in September, giving the grass a chance to sprout and pre-empt the ground in the fall. BEN P. EDGERTON.

Hicksville, Ohio, Dec. 4.

FREEZING AND THAWING LIFTS CLOVER OUT BY THE ROOTS.

We had a drouth this fall, but it will not hurt the clover as much as wet ground would, combined with no snow and cold. The freezing and thawing is what lifts the clover out by the roots. During a dry spell the freezing does not hurt the plants so much. I am looking for a good clover crop in the spring. The alsike clover looks very well now. I am farming 140 acres.

Middletown, Pa. D. J. ESHLEMAN.

CLOVER FOR NEXT YEAR DOUBTFUL.

It has been real dry here. The new seeding is pretty slim. I was talking with a neighbor a few days ago, and he said he paid out over $150 for seed last spring, and he would not risk it for a hay crop. He said he would mow his old meadow for hay next year.

NORMAN MCLEOD.

Ionia, Mich., Dec. 7, 1908.

WHAT IS MEANT BY WINTER-KILLING OF CLOVER.

On page 1488, Dec. 15, a question is asked in regard to the winter-killing of clover. If we have much freezing and thawing during the winter, it heaves the clover up, yes, sometimes pulls it clear on top of the ground. This is very hurtful to clover. And then sometimes a drouth in April or May does much damage to clover when it is pulled up during winter. HARRY LIPP.

Defiance, O., Dec. 28.

DROUTH KILLED WHITE CLOVER.

The drouth has killed our prospects of white-clover honey for next year. I expect to ship my bees to mountains about 40 miles away.

Corbin, Ky., Dec. 10. O. R. WEAVER.

SAN FRANCISCO QUOTATIONS TOO HIGH.

I noticed in an article on page 1426, Dec. 1, you ask for opinions of California bee-keepers on the San Francisco quotations. In reply I will say that they are too high. I have just returned from Stockton, which is 80 miles from San Francisco, and connected by a waterway, thereby having cheap transportation; and while there I saw large quantities of choice comb honey retailing at 3 sections for 25 cents. I have sold about 600 lbs. here at the same price, and that is about the average price to the producer, instead of 17 cts., as you have quoted.

Orosi, Cal., Dec. 8. ROY STEVENS.

OUR HOMES

BY A. I. ROOT

Brethren, if any of you do err from the truth, and one convert him; let him know, that he which converteth the sinner from the error of his way shall save a soul from death, and shall hide a multitude of sins.—JAMES 5: 19, 20.

Jesus saith unto them, My meat is to do the will of him that sent me, and to finish his work.—JOHN 4:34.

On our way down to Florida we reached Atlanta, Ga., about 3 P.M., and were told that our next train would not leave until 9:15 that night. What should we do with the six or seven hours that lay before us in that great and growing city? I went first into the grocery stores to see if I could find the address of any bee-keepers on the honey offered for sale, but didn't find any near by. Had we known of this stop-over I would have provided a list of our subscribers. A policeman told us we should visit Lake Park, two miles out on the trolley line, and we passed an hour or two viewing the fine collection in their zoological grounds; also the wonderful cyclorama of the civil war in that vicinity. I talked with the car conductor about prohibition in their beautiful city, and he assured us the "lid" was kept "on" pretty faithfully.

A lady passenger informed us that a mild beer was sold to some extent, but not very much. Old topers objected to it because it took so much of it to "do any good," and the authorities were discussing shutting down on *that* also, because it seemed to keep alive the old appetite in others. Mrs. Root suggested we go in and sample it; but the places that had the "near beer" signs out were hardly fit for a lady to go into; and, besides, there was a general air about such places of "nothing doing." I still think Mrs. Root's point was a good one. Christian parents *should* make it a point to go into all places where their children are likely to go, and they should also sample the thing the children are likely to sample. With this idea in view we visited a moving-picture show. A scene from the Arabian Nights was most wonderful in its get-up; but we should have admired it more if some of the nude (or almost nude) dancing girls had been left out.

After supper Mrs. Root sat down to await our train in the beautiful new depot; but I went out on the street, and I must confess almost with a dissatisfied feeling with the selfish way I had been so far using the bright new day. I think I had just breathed something like the little prayer I have been telling you about of late, "Lord, help me to learn the lessons thou art striving to teach me," when I looked into the plate-glass windows of one of the largest and finest barbering establishments I ever came across. I decided to go in and get slicked up before I met my Florida friends I passed perhaps a dozen chairs before I found a vacant place.

Let me digress a little here. While it is true that some people "talk too much," especially on trivial or unimportant matters, it is also true that we who are "hungering and thirsting" after righteousness *must* talk and get acquainted or we can not do the Master's work. As I sat down in that barber's chair I really had no thought of lending a helping hand to any one in such a place with such surroundings; therefore I was almost startled when the young man said, abruptly:

"I have to-day broken off on tobacco. I have given it up for good."

Had I been among a lot of bee-keepers I should have suspected some one was putting off a joke on me; but as I glanced into the face of the speaker he looked so honest and sincere that I became convinced the dear Savior *had* heard my little prayer, and this was a part of the answer. Said I:

"My good friend, it would seem, then, that you have some good reason for not waiting until New Year's day. Do you mind telling me *why* you have given up tobacco for good?"

"Well, for one thing it makes me nervous; and for the trade I am just learning, one wants all his nerves."

It occurs to me just now that a barber also wants a *clean sweet breath*, if anybody does, before he comes so near the face of his customer.

"Will you mind telling me of the other reasons why you are so determined to break off?"

"Well, I have a boy thirteen years old who has never used it; and how can I caution him while I use it myself?"

I wanted to jump out of that chair and take him by the hand at this; but I was not quite ready yet. Listen:

"My boy has been swearing, and his mother said she feared she would have to punish him for it; but I said, 'No, no! don't punish him. I am afraid he has heard *me* swear. I will stop it for his sake, if for no other, and we will *both* make an agreement to break off.'"

May God be praised for this simple honest testimony. Some of you have laughed at me because I urge you to get married and have some boys and girls; but can you not see from the above how a wife and a boy brace a man up to *be a man* created in God's own image? May God bless and strengthen that boy, and all other boys like him, to do the work that none *but* a boy can do. This new-found friend told me further that he had once before given up tobacco for *four years*, and *then* went back. He said, too, he used to drink somewhat, but the Atlanta wave of reform had helped him to give it up. No, he was not going to *church*, but he had gone several times to *Sunday-school* with that *same thirteen-year-old boy*.

Why, that boy is a messenger of righteousness, and doesn't know it.

By this time workmen from other chairs were listening. A man near by, who was waiting for a customer, edged up to us while I exhorted my friend to ask the Lord Jesus Christ to take the tobacco, swearing, strong drink, and all the rest, and make a full and complete job of it. He partly gave me a promise, and then for the first time Satan got in a finger and suggested that these people were all "laughing in their sleeves" to see an old man make himself ridiculous in such a public place as a fine up-to-date "tonsorial parlor." I am not sure I have got the name right, but it was something like it.

I went over to the fine depot, and told Mrs. Root about it, and then added:

"Sue, I have not yet had my afternoon nap, and I really *must* have a little sleep or I can not hold out until after nine o'clock"

We fixed my overcoaf and luggage so I could curl down pretty comfortably; but just as I was dozing off I caught a glimpse of a face that seemed familiar. It was the man I had been talking to. He and his friend from the next chair, knowing I did not leave until nine, had come over for a little *more* counsel — that is, if I did not mind giving them a little more of my time; and I was fearing I had been laughed at. You all know what the Master said to Peter — "O thou of little faith! wherefore didst thou doubt?"

Both were married; each had a boy; and before I finished both had given me their hands with a pledge to accept the Savior I had held up to them. They also promised to go to the pastor of their respective churches and tell *him* what they had promised me. They said their wives would be more than ready to go with them. In fact, one wife was already a member. Both are going to write me and report progress.

Dear friends, it is a good thing to get people interested in gardening, bees, or poultry; but when you start the inmates of a home, as God in his great mercy permitted me to start these two young men, every thing else falls into insignificance. Our first text tells the story. It is not only "saving a soul from death," but — go back and read that story about the "whisky-jug." Think of the wreck and ruin it caused. Now view the contrast, "shall hide a *multitude* of sins." I want to see a report from one or both of these men on these pages; and who knows but we may, sooner or later, hear from that thirteen-year-old boy? One of these men lives near Geo. E. Boggs, somewhere in North Carolina. If I remember, friend Boggs is a Christian man, besides being a very successful bee keeper. Will not he give a little push on this ball I have started rolling? Right here something makes me feel that my good friend *Geo. E. Hilton* might have a word to offer in regard to what I have been telling you. After these friends were gone Mrs. Root asked if I had better not take my nap. To my great surprise I did not feel sleepy at all, and then I remembered that, after the Master had talked with the woman at the well, his disciples urged him to partake of the food they had brought. Our second text tells us what he said — "My meat is to do the will of him that sent me, and finish his work."

HIGH-PRESSURE GARDENING.

The letter below should have been given last spring, but it was crowded out; but as it contains facts of much interest to many of our readers we give it place here:

HIGH-PRESSURE GARDENING IN FLORIDA.

Mr. A. I. Root:—As you are so much interested in gardening I think you should not fail to come up and visit the "Celery City." Bradentown and vicinity is a tame affair compared with this place. I surely believe it would be time well spent for you, and a pleasant surprise. I had heard considerable about the celery here, but had no idea it was grown on the scale it is. I think there are more than 1000 acres here, and now is the height of the harvest. If you wait fifteen days before coming, much of the crop will be cut.

One acre is yielding about 1000 crates, and sells at $2.25 per crate. Celery land cleared, and ready to go to work on, is selling at from $1000 to $2000 per acre. W. W. CRIM.

Sanford, Fla., March 2.

In fact, in a few days I hope to be able to give a report in regard to celery-growing in Florida, right up to date.

POULTRY DEPARTMENT

"NOTHING TO DO BUT TO GATHER THE EGGS," ETC.

My seventy *laying hens* all seemed glad to see me, as Mr. Rood suggested they would be; but I found very soon there *was* something to do besides "just gathering the eggs." Mr. Rood is so busy just now gathering his strawberries that he delegated the chickens to one of his helpers, a very good man indeed, but not particularly a chicken man. I found four hens sitting on china nest eggs. One hen was laying in the incubator-cellar, so near the edge of the shelf that several eggs rolled off; but they didn't strike the cement floor and break, for the tile drain had got stopped, and they dropped into the *foot of water* that covered the floor. In a nail-keg under the porch were 14 eggs, but evidently *not* "strictly fresh." Under the house a lot of eggshells indicated where the skunks had dined "sumptuously." My flock of nearly 100 had been decimated by owls that took them out of the pine-trees by night. These owls kill their prey by striking their sharp claws through the head of the chicken. Mr. Rood frightened the owl away with his gun one night, and had the chicken for breakfast. The day of my arrival (Dec. 18) I got *three* eggs from the 70; the next day four, and the third day five. I expressed my $5.00 male bird and a buff Orpington pullet from Medina to this place at a cost of $2.70. Both stood their three-days' trip in fine shape, and the third day the pullet commenced laying again.

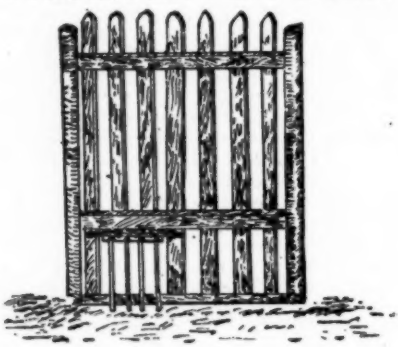
Last winter I told you of Mr. Rood's big crop of lettuce when lettuce happened to be such a drug on the market that I fed great wheelbarrow loads of it to my chickens. Now listen. When we left in April a fine crop of Irish potatoes had taken the place of the lettuce. After the potatoes were dug and sold he took from *the same ground* a crop of hay (beggarweed, I think), and to-day great stools of strawberries laden with green and ripe berries are *on that very ground.* I confess I can't understand it. He says the berry-plants were set out in September, and now they are full of fruit. This ground is not only heavily fertilized, but it is expensively tiled, and under sub-irrigation.

I have told you about the wonderful mulberries that grow in this region. Well, last winter I bought of Reasoner Bros. (Oneca) half a dozen little trees. I don't think they were over three feet tall; but to-day their branches extend up 15 to 20 feet, and the trunks are as big as my arm. They are on a strip of ground near an open ditch in the poultry-yard, where I grew "sprouted oats" all last winter. Mr. Rood says they will likely bear fruit before we leave in April. If they do, there will be some wonderful berries, you may be sure. Oh, yes! one of the four "sitting hens" was my "fighting mother" of two years ago. I suspected it when I went to shut her up, and her leg-band told the story; and on account of "old scores" I took pity on her and "scraped up" fifteen eggs and—let her sit. I didn't give her the eggs that rolled off the shelf into water (as fast as the hen laid them) either.

A "BEE-ESCAPE" FOR CHICKENS.

I take the following from the *Farm and Home* for Feb. 1, 1908:

I find it very convenient to arrange a gate that the hens can open for themselves going one way, but through which they can not return. In most farm poultry-yards hens escape frequently one way and another, but are soon glad to get back with the others if there is a chance to re-enter the coop. A small gate is set inside of a large one, as shown in the cut. The slats may be



made either of heavy wire or of wooden rods fastened between two strips of board at the top, and hinged on a piece of wire. When the hens are inside the gate they can not get out unless the large gate is open; but when they are outside they can enter by pushing their heads between the slats of the small gate, which rises, allowing them to pass through, and then falls back. The hens learn very quickly to push their heads between the slats to get back into the yard.—I. A. FISKE.

I have been holding the above now for nearly a year in order to make some experiments in the matter before putting it in print, and I have gone far enough to decide there is very great need of some simple apparatus — something that can be sent by mail, if possible—that will enable chickens to get into the yard but not to get out of it. I have made several arrangements that worked fairly well, except that the chickens, sooner or later, contrive in some way to get out through the escape as well as get in. They are wonderfully sharp and ingenious; in fact, I have sometimes thought one might almost teach a chicken to read and write if he were to exercise patience and pains enough. Now, I wish some of our bright inventors would set to work and get up a successful device that could be furnished for a few cents, and sent by mail. I will advertise any such successful arrangement free of charge. As mentioned in the clipping, chickens will get out of almost any yard now and then; and it is also true that they are very glad to get back inside again if there can be openings at hand; but this opening must not let others get out while the others are getting in. A gate that can be opened and closed again by pulling a long string does the business nicely, but we want something that is automatic. Whatever it is, it should be located in some corner where you can drive the chickens where they will see it readily. We are selling, year after year, hundreds of dollars' worth of bee-escapes that permit the bees to pass out but not in. Why should we not have a similar arrangement for chickens?

And, by the way, there ought to be not only different sizes for different breeds of chickens, but I feel sure many times it would be convenient to have something of the sort for quite small chickens; and these small ones could surely be sent by mail.

SIX EGGS A DAY WITH ONLY SIX HENS; ONLY 25 TO 40 WITH 100 HENS; ALSO SOMETHING ABOUT PARTRIDGES AND QUAILS.

Dear Mr. Root:—Some time ago when you gave your experience in keeping a "hennery" I was sorely tempted to write you of my success, but did not; but now since you have invited correspondence in reference to pheasants (ruffed grouse) I will give you some of my experience with both.

Last fall, when we were about to leave for Florida we had about 100 chickens—possibly 90 hens and 10 roosters. We were getting from 25 to 40 eggs per day, and thought we were doing fairly well. We sold off all but six pullets, which we left in the care of my nephew. When we came home in April we got our pullets. I purposed getting a male bird, but neglected it. But meantime the six pullets gave us just six eggs per day, and seldom during the past month have they failed to give us the half dozen. I make no comments. I didn't get a male bird after all.

As to the partridges, I have had a good deal to do with them ever since a boy. In my younger days they were very plentiful. I was an expert with a rifle, and many a "top-knot" I cut off while the birds were "budding" in the spring. I considered a roast partridge about the choicest dish in all the *menu*. I have tried to domesticate them, but never succeeded in raising one till it was half grown. I put the eggs under a hen; but as soon as they were hatched the little birds would skulk off into the grass and die. Not so with quails. I have had them run with a hen till they were grown, and would seem as tame as the common chickens; but in the following spring they usually would mate and go off to the fields, no more to return.

I think it has been beneficial to me having spent the cold weather in the South. W. C. GAULT.

Savannah, Ohio, Aug. 6.

Your report corroborates the principal point in the Philo system. Six hens kept by themselves will lay ever so many more eggs in proportion than 60 or 100; but so far as my experience goes your plant will cost ever so much more to have a little house, to say nothing of a dooryard for every six hens; and after getting it, it is a big lot of work to manipulate the doors, stairways, etc.

PLANTING BASSWOODS IN THE FALL; SOMETHING ABOUT BASSWOODS AND RABBITS.

Dear Sirs:—A year ago this fall I got some basswood-trees of you. They nearly all grew well this year; but my difficulty is during the winter. The rabbits gnaw off the buds. Do you know of any preventive—something not injurious that could be brushed on? Protecting a large number of small trees by means of paper, etc., is rather laborious and expensive. I have carbolineum, and I notice it is applied to trunks of trees to keep away mice; but I should be afraid of injury if applied to buds or upper parts of small trees. J. R. COLEMAN.

Birr, Ont., Nov. 4.

Friend C., we are very glad to know that you succeeded so well with fall planting. We had trouble with rabbits just one spring. They ate off all the buds as high as they could reach, and even stood on their hind feet to get the highest ones. I know of no remedy except putting a two-foot fence around your nursery, made of the cheapest kind of wire netting. I did this in Florida, and the rabbits never got over it. By setting a steel trap close to the fence on the outside we got quite a number that ran clear around the inclosure trying to get in. I can not tell you whether the carbolineum would hurt the young bees or not. Can some of our experiment stations inform us?

A. I. ROOT IN HIS FLORIDA HOME.

Please, friends, do not send orders for goods to me here in Florida. I have nothing here whatever to *sell*. Of course, I can send your letter on to Medina, but that makes delay and possible confusion. The only thing I have to "give away" is advice, and that is always freely and gladly given if you inclose an *addressed postal*. The *most* of you can write your address so your own postmaster can read it. I am very busy down here, but I can always stop long enough to grasp a pencil and fill a postal card providing I don't have any worry about getting the *address* correct: and you know I am now husbanding my energies so as to hold out for that *one hundred years*.